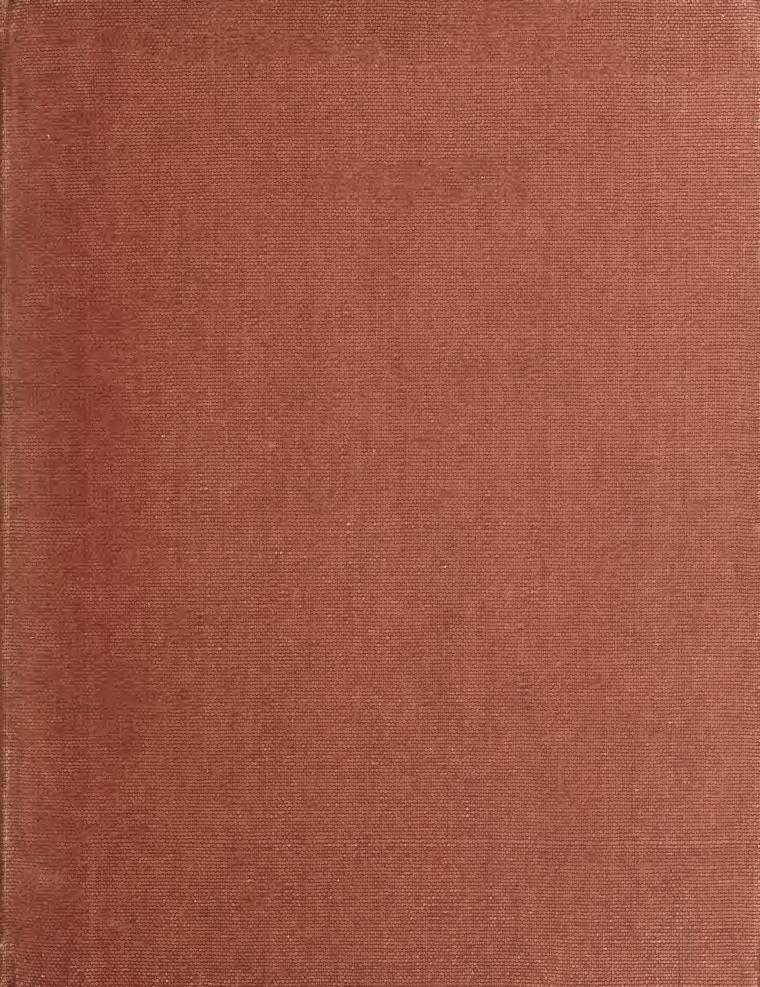
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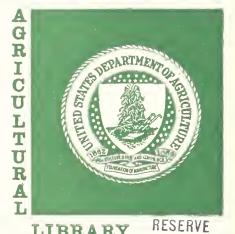




Division of Plant Disease Control

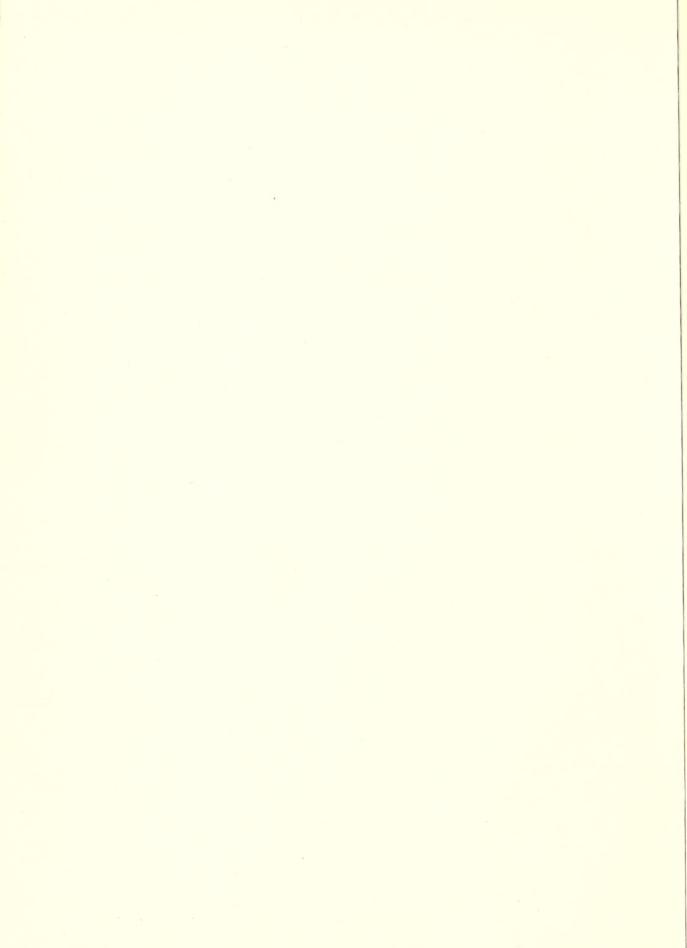
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### CONTENTS

	Page
White Pine Blister Rust Control in the Northwestern Region  Introduction  Progress of Ribes Eradication in the Northwestern Region  Organization and Administration  Appropriations  Expenditures for the Calendar Year.  Expenditures by All Agencies for All Years.  Personnel.	1-8 1 2 3 4 5 6 7-8
Blister Rust Control, Inland Empire. Summary Montana Operation. Clearwater Operation. St. Joe Operation. Coeur d'Alene Operation. Kaniksu Operation. Mount Spokane Operation.	9-91 9-19 20-30 31-44 45-57 58-67 68-83 84-91
Blister Rust Control Work, Mount Rainier National Park	92-95
Blister Rust Control Work, Glacier National Park	96-98
Scouting for Blister Rust in Yellowstone National Park and Adjacent Areas	99
Preeradication Survey of Selected Areas in Grand Teton National Park	100-102
Pine Disease Survey and Scouting for White Pine Blister Rust in the Inland Empire	103-104
Blister Rust Plot Studies	105-113
Developmental Work in Methods of Ribes Eradication and Progress of Ribes Ecology Work	114 <b>-</b> 135
Method of Laying String Status of Recommendations on Special Methods and New	114-116
Developments  Laboratory and Greenhouse Work  Effect of Light and Moisture on Germination and Development  Effect of Grazing on Recently Cutover Areas  Effect of Controlled Grazing  Effect of Deferred Grazing	116-117 117-118 119-126 126-131 131-133 133-135
Photographic and Educational Work	135-139

b substitution

1200

	Page
Appendix	1-11
Accounts (M. L. McWold) - Bureau of Entomology and Plant	3 57
Quarantine Expenditures by Activities - Bureau of Entomology and Plant	1-0
Quarantine	4
Omnibus Tables	5-11

#### WHITE PINE BLISTER RUST CONTROL IN THE NORTHWESTERN REGION

January 1 to December 31, 1941

Herman E. Swanson, Senior Pathologist

\*\*\*\*\*\*

#### INTRODUCTION

report covers the blister rust control activities in the Northwestern a for the calendar year 1941, as conducted by the Eureau of Entomology lant Quarantine, in cooperation with state and private agencies of the North Mashington, Colorado and Wyoming, the U.S. Forest Service the National Park Service. Work was carried on in accordance with ements between the Eureau of Entomology and Plant Quarantine and the other agencies.

A significant feature of the 1941 program was the resumption of financial contributions to the project by private agencies in Idaho. Funds were contributed by the Clearwater Timber Protective Association, the Potlatch Timber Protective Association and the Priest Lake Timber Protective Association. This was the first year since 1932 that private funds were contributed.

The year 1941, marked by heavy rains throughout spring, summer and fall, was favorable for blister rust development. However, the nature of these rains would seem to preclude any abnormally wide distribution of blister rust and severe introduction into new areas because of the heavy downpours which occurred throughout the period of greatest aeciospore dissemination. This conclusion is suggested by the fact that intensive scouting in the territory northwest of Yellowstone National Park, which is outside the heavily infected white pine areas of western Montana and northern Idaho and where blister rust was found on ribes in several locations in 1937, failed to reveal any blister rust infection. The year 1937 was a most favorable year for the spread and development of blister rust and was characterized by frequent light rains in contrast to the very heavy rains in 1941. the other hand the wet conditions prevailing in 1941 were very favorable for increase in the amount of rust in localities where it was already present as evidenced by the great amount of infection that eventually developed on ribes near fruiting cankers.

Weather conditions interfered greatly with the orderly progress of ribes eradication with the result that the working season was one of the shortest in all the years of blister rust control work in the Northwest. This situation along with the great amount of labor turnover which was also partly the result of the adverse weather conditions reduced the amount of planned accomplishment in acreage worked by 30 per cent.

PROGRESS OF RIBES ERADICATION IN THE NORTHWESTERN REGION

State	Initial Work	Reeradication Work	Total
	Number of Acres	s Worked in 1941	
Idaho Montana Washington Total	11,676 4,579 3,970 20,225	41,218 2,387 7,387 50,992	52,894 6,966 11,357 71,217
	Number of Acres Wo	orked in All Years	
Idaho Montana Washington Subtotal	1,63£,535 127,860 123,132 1,833,527	360,481 10,500 . 36,620 407,601	1,993,016 138,360 159,752 2,291,128
Colorado Wyoming Subtotal	14,859 21,760 36,619	1,962 - 1,962	16,321 21,760 38,591
Grand Total	1,920,146	409,563	2,329,709

Detailed reports on the progress of ribes eradication are presented under the following headings:

- 1. Blister Rust Control, Inland Empire. This represents the commercial white pine area of northern Idaho, northwestern Montana, and northeastern Washington. In addition, there is a separate report for each national Forest area and adjacent state and private lands. These individual reports include:
  - a. Cabinet and Kootenai operations (Montana)
  - b. Clearwater operation (Idaho)
  - c. St. Joe operation (Idaho)
  - d. Coeur d'Alene operation (Idaho)
  - e. Kaniksu operation (Idaho and Washington)
  - f. Mount Spokane operation (Idaho and Washington)
- 2. Blister Rust Control, National Parks
  - a. Mount Rainier
  - b. Glacier
- 3. Blister Rust Control, Central Rocky Mountain Region
  - a. Colorado
  - b. Wyoming

The 1938 annual report contains the last report on ribes eradication work performed in this region.

## 100065

#### ORGANIZATION AND ADMINISTRATION

The Bureau of Entomology and Plant Quarantine is responsible for the general planning, coordination, and technical supervision of the blister rust control program, for the supervision of all cooperative work on state and private lands and for the work in connection with development of methods of control and control investigations. The Forest Service and National Park Service are responsible for the direct supervision of control work on their lands.

The ribes eradication program, which constitutes the major part of the blister rust control project, was made up of the following units in 1941:

Bureau of Entomology and Plant Quarantine:	:		Camps	Workers
ERA (financed by WPA allotments) Cooperative (financed by lederal, state CCC (S-camps in Idaho)	and pri	ivate funds)	7 4 1	210 187 31
Total			12	423
U. S. Forest Service:				
Regular (financed by federal funds) CCC (F-camps) ERA (financed by WPA allotments)			33 9 <u>1</u>	1,181 272 30
Total			43	1,483
National Park Service:				
Regular CCC			2	65 62
Total			4	127
Summery:				
	Seaso Camps	on 1940 <u>Workers</u>	Seaso Camps	on 1941 Workers
Regular and Cooperative ERA CCC	34 20 23	1,204 1,266 1,453	39 8 <u>12</u>	1,433 240 365
Total	77	3,923	59	2,038

#### APPROPRIATIONS

Bureau of Entomology and Plant Quarantine (Northwestern Region)

### Regular Appropriation:

Fiscal year 1941		\$ 31,700.00
Fiscal year 1942 (as of 12/31/41)		
Project 3101.14 (Adm.)	\$74,400.00	
Project 3103.14 (Coop.)	27,041.00	
Project 3104.14 (Purchase)	650.00	102,091.00
ERA (WPA) Allotments:		
Fiscal year 1941:		
ldaho		212,860.00
Washington		33,000.00
Administrative		6,280.00
Fiscal year 1942 (7/1/41-12/31/41):		
Idaho		77,000.00
Washington		13,750.00
Administrative		2,600.00
Cooperative Funds: (deposited with U. S	. Treasury)	
State of Idaho	14,243.60*	

Priest Lake Timber Protective Association 4,232.62 30,000.00

5,107.46

Clearwater Timber Protective Association 6,366.32

Potlatch Timber Protective Association

<sup>\*</sup>Biennial appropriation by Idaho State Legislature for period April 1, 1941, to March 31, 1943, was \$38,000.00.

### EXPENDITURES FOR CALENDAR YEAR 1941

### Bureau of Entomology and Plant Quarantine:

		Fiscal Year 1941	Fiscal Year 1942	Total
Regular Funds:				
Idaho (S	3101.14)	\$42,327.42	\$19,485.69	\$ 62,313.11
Idaho (: Subtotal Id	3103.14)	\$42,827.42	6,810.78 \$26,296.47	6,810.73 \$ 69,123.89
	3101.14)	3,140.13	5,950.70	9,090.83
Washington (3		2,465.83	5,256.89	7,722.72
Wyoming (			333,69	833.69
Total		<u>-</u> 448,433.38	\$38,33 <b>7.</b> 75	\$ 86,771.13
ERA (Project Fi	unds):			
Idaho		\$48,174.25	\$47,541.51	\$ 95,715.76
Washington Total		9,145.70 \$57,319.95	11,567.30 \$59,108.81	20,713.00 \$116,428.76
1.006.1		401,010.00	φυσ,103.01	\$2.10, \(\frac{1}{2}\)
ERA (Administra	<u>stive Funds)</u>		и	4
Ideho		\$ 3,460.00	\$ 2,070.00	\$ 5,530.00
Washington Total		659.05 \$ 4,119.05	487,61 \$ 2,557.61	1,146.66 \$ 6,676.66
10041		ψ ±,113.00	Ψ 2,001,01	Ψ, ο,ο,ο.οο
Cooperative Fu				
State of Idal				\$ 7,542.73
Private (Ida) Total	по)			15,756.40 \$ 23,299.13
10041				Ψ 20,200.10
Bureau of Entomo	logy and Pla	nt Quarentine (Sum	mary):	
State	Regular	ŁRA	Cooperative	Totel
Idano	\$69,123.89		\$23,299.13	\$193,668.78
Montana	9,090.83 7,722.72		**	9,090.83
Weshington Wyoming	833.69	•	-	29,582.38
Total	\$86,771.13		\$23,299.13	\$233,175.68
U. S. Forest Ser	vice:			
	Name of Street, or other Desires			
State	Regular	ERA		Total
Idaho	\$375,898.32			\$375,898.82
Montana	33,936.00			39,357.00
Washington Total	35,179.18 \$445,014.00			35,179.18 \$450,435.00
10001	# 1 10 , O.L. 1 OO	#O, ±01.00		\$400,400.00
National Park Se	rvice:			

Note: Expenditures from CCC funds not included in this report.

StateParkRegularWashingtonMount Rainier\$8,780.63

State

### EAPENDITURES BY ALL AGENCIES FOR ALL YEARS

### Bureau of Entomology and Plant Quarantine (1922-1941):

### Federal Funds:

State Idaho Montana Washington	Regular \$1,234,284.49 201,043.92 219,592.47	ERA \$3,002,009.44 196,847.11 453,898.95	NIRA \$470,341.62 83,306.79 105,199.60	Totel \$4,707,135,55 486,197.82 783,691.02
Subtotal	\$1,654,920.88	\$3,657,755.50	\$664,348.01	\$5,977,024.39
Colorado Wyoming	11,852.04 11,314.28	59,396.51 58,283,96	8,041.45 7,107.41	79,290.00 76,705.65
Subtotal	\$ 23,166.32	\$ 117,630.47	\$ 15,148.86	\$ 155,995.65
Grand Total	\$1,678,037.20	\$3,775,435.97	\$679,496.87	\$6,133,020.04

### Cooperative Funds (1928-1941):

State	State	Private	Total
Idaho	\$139,691.23	\$104,140.03	\$243,831.26

### U. S. Forest Service (1930-1941):

Forest	State	Regular	ERA	NIRA	Total
Clearwater	Idaho	\$ 606,537.54	\$ 78,808.87	\$ 334,645.93	\$1,019,992.34
St. Joe	Idaho	1,219,110.14	6,983.40	376,356.66	1,602,450.20
Coeur d'Alene	Idaho	491,116.07	197,410.60	472,399.21	1,160,925.88
Kaniksu	Idaho	193,788.11	137,952.32	185,782,36	517,522.79
Kaniksu	Washington	134,605.72		134,320.68	268,926.40
Cabinet	Montana	135,994.22	108,618.46	149,358.06	394,470.74
Kootenai	Montana	39,076.14	28,233.00	-	67,309.14
Subtotal	Idaho	\$2,510,551.86	\$421,155.19	\$1,369,184.16	\$4,300,891.21
Subtotal	Montana	175,070.36	136,351.46	149,858.06	461,779.88
Subtotal	Washington	134,605.72	-	134,320.68	268,926.40
Grand Total		\$2,820,227.94	\$558,006.65	\$1,653,362.90	\$5,031,597.49

### National Park Service (1930-1941):

Pa	erk	State	Regular
Mount	Rainier	Washington	\$31,126.00

#### PERSONNEL

The following are the permanent personnel of the Bureau of Entomology and Plant Quarantine who were employed in the Northwestern Region during the calendar year 1941:

- 1. In charge of the Northwestern Region, H. E. Swanson, Senior Pathologist, Assistant Regional Leader, E. L. Joy, Forester.
- 2. Cooperative Local Control:
  - a. Montana Operation: Technical Supervisor, A. S. Skoglund, Assistant Pathologist.
  - b. Clearwater Operation, Idaho: Technical Supervisor, F. J. Heinrich, Associate Pathologist. Checking Supervisor, H. J. Faulkner, Chief Scientific Aid.
  - c. St. Joe Operation, Idaho:
    Technical Supervisor, H. J. Hartman, Associate Forester.
    Assistant, J. C. Gynn, Assistant Pathologist.
    Checking Supervisor, W. F. Painter, Assistant Pathologist.
  - d. Coeur d'Alene Operation, Idaho: Technical Supervisor, A. L. Pence, Jr., Associate Forester.
  - e. Kaniksu Operation, Idaho and Washington: Technical Supervisor, F. O. Walters, Associate Pathologist. Checking Supervisor, H. A. Brischle, Assistant Pathologist.
  - f. Mount Rainier and Glacier National Parks and Mount Spokane Operation, Idaho, Montana, Washington:
    Technical Supervisor, M. C. Riley, Associate Forester.

### 3. Projects:

a. Control Investigations:

In charge, R. L. MacLeod, Associate Pathologist.

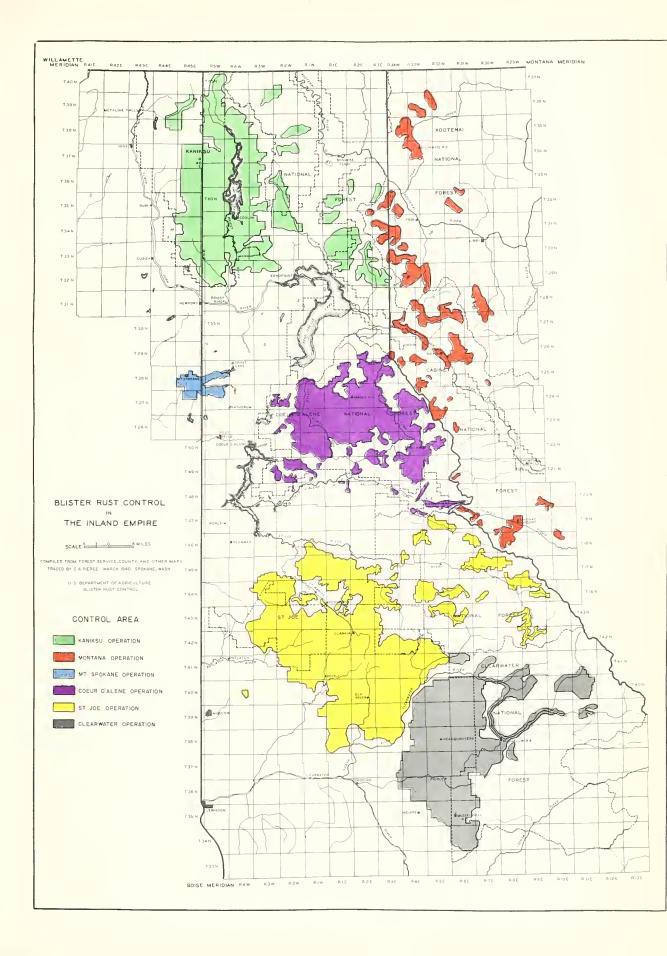
- C. R. Stillinger, Assistant Pathologist.
- C. M. Chapman, Chief Scientific Aid.
- b. Development of Ribes Eradication Methods:
  Ecological and Chemical, V. D. Moss\*, Associate Forest Ecologist.
  Mechanical, J. F. Breakey\*, Assistant Pathologist.
- c. Informational Work:
  In charge, E. L. Joy, Forester.
  H. M. Cowling, Chief Scientific Aid.

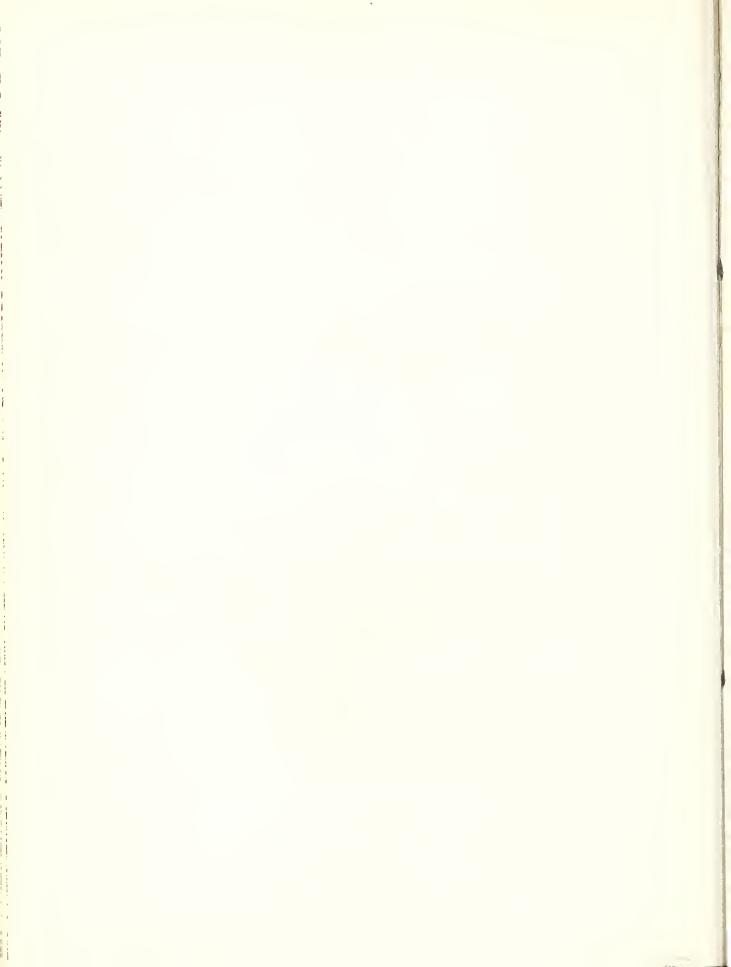
<sup>\*</sup>Personnel assigned to Northwestern Region by H. R. Offord, Pathologist in charge of methods development in the West.

- 4. Business Administration and Clerical Work:
  - a. E. G. Schmidt, Senior Administrative Assistant.
    - E. K. LaPrey, Field Assistant.
  - b. M. L. McWold, Senior Clerk.
    - E. T. Dunlap, Assistant Clerk-Stenographer (Resigned).
  - c. L. E. Klatt, Senior Clerk.
    - D. A. Anderson, Assistant Clerk-Stenographer.
    - M. M. McLean, Assistant Clerk-Stenographer.
    - J. R. Pringle, Junior Clerk-Stenographer.
    - M. Wilson, Junior Clerk-Stenographer.
  - d. H. D. Langley, Junior Administrative Assistant in charge of personnel.

The following are the personnel of the Forest Service in charge of blister rust control work on National Forest lands:

- 1. Cabinet and Kootenai National Forests, Montana C. H. Johnson, Associate Pathologist.
- 2. Clearwater National Forest, Idaho D. Kyle, Assistant Forester.
- 3. St. Joe National Forest, Idaho D. J. Moore, Assistant Pathologist, and M. D. Oaks, Principal Agricultural Aid.
- 4. Coeur d'Alene National Forest, Idaho N. D. Nelson, Assistant Forest Supervisor.
- 5. Kaniksu National Forest, Idaho and Washington F. O. Walters, Associate Pathologist (Eureau of Entomology and Plant Quarantine and U. S. Forest Service), Kermit Miller, Assistant Pathologist.





### BLISTER RUST CONTROL, INLAND LMPIKE, 1941 Бу Herman E. Swanson

Senior Pathologist

#### INTRODUCTION

In the Northwestern Region the bulk of blister rust activities is concentrated in the extensive commercial white pine area of the Inland Empire located in northern Idaho, northwestern Montana, and northeastern Washington. Other control work in the region's program is centered around the protection of small units of five-needle pines located chiefly in National Parks. This report summarizes the progress of blister rust control work on only the commercial white pine area of the Inland Empire by consolidating the following operation reports:

- 1. Montana Operation (Kootenai and Cabinet Forests)
- 2. Clearwater Operation
- 3. St. Joe Operation
- 4. Coeur d'Alene Operation
- 5. Kaniksu Operation
- 6. Mount Spokane Operation

Progress of control in 1941 fell short by about 30 per cent of expected accomplishment. This was a direct result of the heavy and continuous rains in May and June, and then in the last part of August and September which disrupted effective work on ribes eradication. Not only did this condition make 1941 one of the shortest working seasons ever encountered since blister rust work was started in the region in 1924, but it also caused an exceptionally high turnover in labor. It was impossible to keep a full quota of men in the camps because of the excessive amount of lost working time.

The number of workers engaged in the blister rust control program was about one-half the number working in 1940. The reduction came in the CCC and ERA (WPA) programs. The following tabulation shows the comparison:

	Number of	Workers
Program*	1940	1941
FS-Regular	1,138	1,131
FS-ERA	<b>37</b> 9	30
CCC	1,268	303
EQ-Cooperative	66	187
EQ-ERA	887	210
Total	3,738	1,911

### \*Designations used in this report:

EQ - Bureau of Entomology and Plant Quarantine FS

- Forest Service

Reg. - Program on regular departmental appropriations F-CCC - Forest Service - Civilian Conservation Corps

S-CCC - State - Civilian Conservation Corps

ERA - Emergency Relief Program (WPA) NIRA - Public Works Program (PWA)

EQ-Coop. - Program financed cooperatively by Eureau, State of Idaho and Timber Protective Associations

In view of the abnormally bad weather conditions, short season, large labor turnover and much smaller crew, the net accomplishment of 69,738 acres worked compares ravorably with the 115,608 acres worked in 1940. It is significant to note that the average number of ribes pulled per acre is declining from year to year, indicating that the more difficult areas have been worked and that less difficult areas will be encountered in the future. In 1939 the average number of ribes pulled per acre was 272, in 1940 it was 170, and in 1941 it was 125. In line with this has been a corresponding decline in the amount of labor required to work an acre. In 1939, 1.51 man-days per acre were required, in 1940, 1.22 man-days, in 1941, 1.10 man-days. These trends are continuing even though there is an increasing concentration of work on reproduction stands and reproducing cutover areas which are normally the most difficult to work.

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#### STATEMENT OF EXPENDITURES AND COSTS

The following tables include those expenditures made in connection with the ribes eradication program or projects directly associated with this activity. Effective man-day costs are high as a result of the great amount of lost time due to weather conditions. These expenditures include federal funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine and the U.S. Forest Service, and state and private funds deposited with the U.S. Treasury.

TABLE 1

£XPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941

INLAND EMPIRE

Cooperating Agency	Appropriation	Amount
	Regular	\$445,014.00
Forest Service	ERA	5,421.00
	Total	450,435.00
Bungsu of Matemales	Regular	36,649.54
Bureau of Entomology and	Regular-Coop.	6,810.78
	ERA	100,104.12
Plant Quarantine	Total	143,564.44
State of Idaho and	State	7,542,73
Timber Protective	Private	15,756.40
Associations	Total	23,299.13
All Agencies	Total	\$617,298.57

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CLASSIFIED EAPENDITURES, CALLENDAR YEAR 1941 INLAND EMPIRE

				Bureau	Bureau of Entomology and	gy end	Contributed	
	FIC	Forest Servic	ee	P1	Plant Quarantine	ne	Funds	
							State of Idaho	
						-	and Timber	
							Protective	
Item	Regular	ERA	Total	Regular	ERA	Total	Associations	Total
Sal. perm. men	\$ 14,009.29		\$ 14,009,29	14,009.29 \$27,366.90		\$ 27,366.90		41,576.19
Salaries, temp.men	40,167.49 \$ 185.00	\$ 135.00	40,350.49		\$ 13,850.86	13,830.86		54,181.35
Wages, temp. labs.	291,849.79 2,942.00	2,942.00	294,791.79	4,856.90	67,146.87	72,003.77	\$23,299.13	390,034.69
Subs. supplies	71,487.24 2,004.00	2,004.00	73,491.24	7,615,49	10,431.06	13,046.55		91,537.79
Equipment	12,611.13	161.00	12,772,13	225.63	395.79	619.47		13,391.60
Trucks	1,587.67	58.00	1,645.67	1,528.86		1,523,86		1,645.67
Travel and transp.	4,242.59	58.00	4,300.59		4,132.02	4,132,02		5,961.47
Chemicals	1,536.97		1,536,97					1,536.97
Twine	4,055.04		4,055.04					4,055.04
Other supplies	3,466.79	15,00	3,431.79	1,868.49	4,107.52	6,056.01		9,517.30
Total	\$445,014,00	\$5,421.00	\$450,435.00	\$43,460.32	\$445,014.00   \$5,421.00   \$450,435.00   \$43,460.32   \$100,104.12   \$143,564.44	\$143,564.44	\$23,299.13	\$617,293.57

TABLE 2A

LISTRIBUTION OF BLISTER RUST CONTROL EAPENDITURES BY PROGRAMS
INLAND EMPIRE

Program	Number of Effective Man-Days	Expenditure: According to Fo		Effective Man-Day Cost
Planning, Coordi-				
nation and Tech-				
nical Direction		EQ-Reg.	\$ 22,599.08	
FS-Reg.	52,461	FS-Reg.	437,795,61	\$ 8.35
FS-ERA	524	FS-ER4	5,421.00	10.35
		State of Idaho	7,542.73	
		Timber Prot. Assoc.	15.756.40	
Cooperative	7,116	EQ-Reg.	12,595.78	6.00
,		EQ-RegCoop.	6,810.78	
		Total	42,703.69	
		EQERA	62,817.39	
EQ-ERA	8,209	EQ-Reg.	1,456.68	7.83
		Total	64,274.57	
			İ	CCC Funds
CCC	8,096	FS-Reg.	3,020.87	Not Included
		FS-Reg.	3,917.52	
Pine Disease	427	EQ-ER.	1,153.69	11.88
Survey		Iosel	5,071.21	
		FS-Reg.	280.00	
Canker	2,797	EQ-ERA	15,568.17	5.67
Elimination		Total	15,848.17	
EQ-ERA Winter Pro	ject	EQ-ERA	20,564.37	
Total Cost of 194	l Program		\$617,298.57	

	Forest Service	Bureau
Number of meals served	304,800	94,109
Average cost per meal	\$0.23 <del>4</del>	\$0.204
Pounds twine used	13,709	4,992
Pounds chemical used	15,360	605

### SUMMARY OF RIBES ERADICATION, 1941 INLAND EMPIRE

#### TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working		Total Acres	Effective Man-Days		Total Gallons Spray
Open Reproduction	14,360	26,334	7,964	48,658	57,004	6,581,272	
Dense Reproduction	47	939	110	1,096	507	89,832	
Open Pole	2,821	4,627	719	8,167	3,881	279,511	
Dense Pole	502	527	25	1,054	117	2,787	
Open Mature	587	865	219	1,671	1,301	156,538	
Cutover	804	3,357	1,504	5,665	6,616	780,140	
Brush	718	48	57	823	289	18,795	
Burn		348		348	751	233,398	
All Upland	19,839	37,045	10,598	67,482	70,466	8,142,273	
Stream (Hand)	326	1,285	645	2,256	5,290	506,424	
Stream (Chemical)	20	427	125	572	875	48,756	16,252
All Stream	326	1,285	645	2,256	6,165	555,180	
All Types	20,165	38,330	11,243	69,738	76,631	8,697,453	

#### TABLE 3A - FIRST WORKING

					Per	r Acre	Basis
		Effective	Total	Gallons	Man-		Gallons
Eradication Type	Acres	Man-Days	Ribes	Spray	Days	Ribes	Spray
				-1			-1
Open Reproduction	14,360	17,038	3,145,752		1.19	219	
Dense Reproduction	47		3,668		1.06	78	
Open Pole	2,821	898	103,964		.32	37	
Dense Pole	502	2	197		.01	1	
Open Mature	587	207	25,316		. 35		
Cutover	804		204,130		1.34		
Brush	718		9,744		.21		
All Upland	19,839	19,419	3,492,771		.98		
Stream (Hand)	326		233,474		6.05		
Stream (Chemical)	20		2,025		3.90		34
All Stream	326		235,499	0.0	6,29		
All Types	20,165		3,728,270		1.06		
AII 13pvo	20,200	22,100	0,120,210		2.00	100	
	TAI	BLE 3B - SI	ECOND WORK	ING			
Open Reproduction	26,,334		2,531,244		1.12	96	
Dense Reproduction	939	382	11,313		.41	12	
Open Pole	4,627	2,495	110,593		.54	24	
Dense Pole	527	98	2,158		.19	4	
Open Mature	865	680	68,256		.79	79	
Cutover	3,357	3,596	392,357		1.07	117	
Brush	48	100	8,056		2.08	168	
Burn	348	751	233,398		2.16	671	
All Upland	37,045	37,625	3,357,375		1.02	91	
Stream (Hand)	1,285		221,807		1.77	173	
Stream (Chemical)	427	544	27,939	9,313	1.27	65	22
All Stream	1,285		249,746		2.19	194	
All Types	38,330	40,444	3,607,121		1.06	94	
			HIRD WORKIN				
Open Reproduction	7,964		904,276		1.31	-	
Dense Reproduction	110		74,851		.68		
Open Pole	719		64,954		.68		
Dense Pole	25		432		.68	-	
Open Mature	219		62,966		1.89		
Cutover	1,504		183,653		1.29		
Brush	57	40	995		.70		
All Upland	10,598	13,422	1,292,127		1.27		
Stream (Hand)	645	1,043	51,143		1.62		
Stream (Chemical)	125	253	18,792	6,264	2.02	150	50
All Stream	645		69,935		2,01	108	
All Types	11,243		1,362,062		1.31	121	

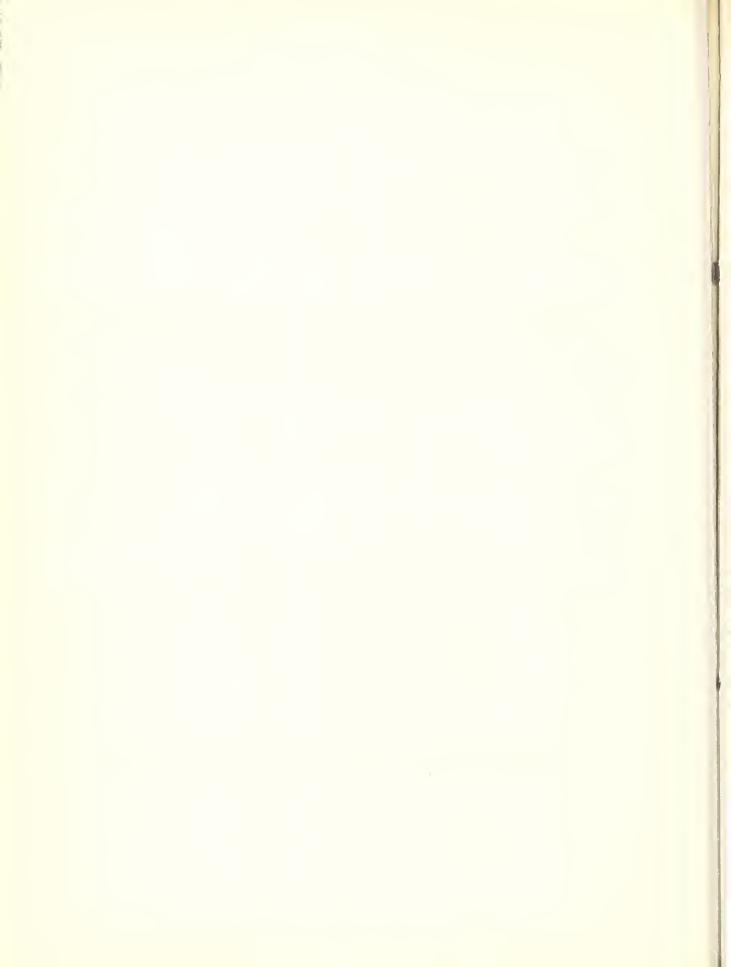


TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
INLAND EMPIRE

State	Working	Class	Acres	Effective Man-Days			Per Acre Man-Days	
		EQ-ERA	1,019	1,274	198,446		1.25	195
		FS-Reg.	10,107	14,020	2,446,432		1.39	242
	First	F-CCC	550	2,321	161,442	675	4.22	294
		Total	11,676	17,615	2,806,320			240
						0/3	1.51	
		EQ-ERA	2,298	2,756	192,974	5 540	1.20	84
		FS-Reg.	22,247	24,257	1,943,024	5,749		87
	Second	EQ-Coop.	5,438	4,572	274,306	405	.84	50
	Docona	F-CCC	693	1,628	92,418	3,159	2.35	133
		S-CCC	1,018	1,568	134,231		1.54	132
		Total	31,694	34,781	2,636,953	9,313	1.10	83
Taba		EQ-ERA	2,334	3,069	248,175		1.31	106
Idaho		FS-Reg.	4,674	6,773	344,000	2,719	1.45	74
		EQ-Coop.	2,227	2,544	450,766	,	1.14	202
	Third	F-CCC	279	966	86,299		3.46	309
		S-CCC	10	18	1,410	6 610	1.80	141
		Total	9,524	13,370	1,130,650	2,719	1.40	119
		EQ-ERA	5,651	7,099	639,595		1.26	113
		FS-Reg.	37,028	45,050	4,733,456	8,468	1.22	128
	All	EQ-Coop.	7,665	7,116	725,072	405	.93	95
	Workings		1,522	4,915	340,159	3,834	3.23	223
		S-CCC	1,028	1,586	135,641	2,501	1.54_	13
		Total			6,573,923	12,707	1.24	124
	TP4 == +		52,894	65,766		12,707		
	First	FS-Reg.	3,970	1,185	591,104		.30	149
		EQ-ERA	303	212	26,105		.70	86
	Second	FS-Reg.	4,253	2,311	643,091		.54	15
		Total	4,556	2,523	669,196		.55	14
		EQ-ERA	779	898	143,220		1.15	184
Washington	Third	FS-Reg.	633	216	75,265		.34	119
	111114		1,412	1,114				
		Total			218,485		.79	155
	All	EQ-ERA	1,082	1,110	169,325		1.03	156
	Workings	FS-Reg.	8,856	3,712	1,309,460		.42	148
	MOTATINGS	Total	9,938	4,822	1,478,785		.49	149
		FS-ERA	537	516	90,551		.96	169
		FS-Reg.	3,868	1,827	207,217		.47	54
	First	F-CCC	114	326	33,078		2.86	290
		Total	4,519	2,669	330,846		.59	7:
		FS-ERA				-		
			20	8	1,289		.40	64
	Second	FS-Reg.	1,784	2,046	189,719		1.15	106
		F-CCC	276	1,086	109,964		3.93	398
Montana		Total	2,080	3,140	300,972		1.51	145
		FS-Reg.	282	51	1,213		.18	4
	Third	F-CCC	25	183	11,714	3,545	7.32	469
		Total	307	234	12,927	3,545	.76	42
		FS-ERA	557	524	91,840		.94	165
	All	FS-Reg.	5,934	3,924	398,149		.66	67
	Workings		415	1,595	154,756	3,545	3.84	37:
	"OT TITES	Total						
			6,906	6,043	644,745	3,545	.88	93
		EQ-ERA	1,019	1,274	198,446		1.25	195
		FS-ERA	537	516	90,551		.96	169
	First	FS-Reg.	17,945	17,032	3,244,753		.95	181
		F-CCC	664	2,647	194,520	675	3.99	293
		Total	20,165	21,469	3,728,270	675	1.06	185
		EQ-ERA	2,601	2,968	219,079		1.14	84
		FS-ERA	20	8	1,289	-	.40	64
		FS-Reg.	28,284	28,614	2,775,834	5,749		98
	Second	EQ-Coop.	5,438	4,572	274,306	405	.84	50
	Decond	F-CCC			909 700			
			969	2,714	202,382	3,159		209
		S-CCC	1,018	1,568	134,231		1.54	132
		Total	38,330	40,444	3,607,121	9,313	1.06	94
Total		EQ-ERA	3,113	3,967	391,395		1.27	126
		FS-Reg.	5,589	7,040	420,478	2,719	1.26	75
	mis 4 3	EQ-Coop.	2,227	2,544	450,766		1.14	202
	Third	F-CCC	304	1,149	98,013	3,545	3.78	322
		S-CCC	10	18	1,410	2,010	1.80	141
						E OCA		
		Total	11,243	14,718	1,362,062	6,264	1.31	121
		EQ-ERA	6,733	8,209	808,920		1.22	120
		FS-ERA	557	524	91,840		.94	165
	۸٦٦	FS-Reg.	51,818	52,686	6,441,065	8,468	1.02	124
	All	FO-Coop	7,665	7,116	725,072	405	.93	95
	Workings	F-CCC	1,937	6,510	494,915	7,379	3.36	256
		S-CCC	1,028	1,586	135,641	.,0,3	1.54	132



TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
INLAND EMPIRE

							Nin	mber of	Acres	Worker	4		,				
				Ву			1,00		Bureau								
			Fore	est Ser	rice		Entom	ology a			centine			Total			
		1	Federel	300 DOI	100			Federal	14 1 14	10 4000	OHUINO		Federal	10001			
			Public					Public		[			Public				
State	Working				State	Private			Totel	Stete	Privete			Totel	Stete	Private	Totel
	First	9,792		9,792	335	530	230		230		789	10,022		10,022	335	1,319	11,676
	Second	18,590	200	18,790	1,105	3,056	1,453	133	1,586	2,283	4,874	20,043	333	20,376	3,388	7,930	31,694
Ideho	Third	2,671		2,671	618	1,666	360		360	2,803	1,406	3,031		3,031	3,421	3,072	9,524
	Totel	31,053	200	31,253	2,058	5,252	2,043	133	2,176	5,086	7,069	33,096	333	33,429	7,144	12,321	52,894
	Firet	3,970		3,970								3,970		3,970			3,970
Woohinston	Second	4,210		4,210		43					303	4,210		4,210		346	4,556
Weehington	Third	633		633							779	633		633		779	
	Totel	8,813		8,813		43					1,082	8,813		8,813		1,125	
	First	3,390		3,390		1,129						3,390		3,390		1,129	4,519
Montene	Second	2,071		2,071		9						2,071		2,071		9	
onconom	Third	123		123		184						123		123		184	
	Total	5,584		5,584		1,322						5,584		5,584		1,322	
	First	17,152		17,152	335		230		230		789	17,382		17,382			20,165
Total	Second	24,871	200	25,071	1,105	3,108	1,453	133		2,283	5,177	26,324	333	26,657			38,330
IJUAI	Third	3,427		3,427	618		360			2,803	2,185	3,787		3,787			11,243
	Totel	45,450	200	45,650	2,058	6,617	2,043	133	2,176	5,086	8,151	47,493	333	47,826	7,144	14,768	69,738

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
INLAND EMPIRE

				Ril	oes by Spec	ies			
			Ribes	Ribee	Ribes	Ribes	Ribee	Ribes	Totel
Working	Eradicetion Type	Acres	lecustre	viscosissimum	petiolere	inerme	irriguum	triste	Ribes
	Open Reproduction	14,360	1,427,338	1,705,644	115	12,203	452		3,145,75
	Dense Reproduction	47	709	2,941		18			3,66
	Open Pole	2,821	69,549	34,415					103,96
	Dense Pole	502	125	72					19
First	Open Meture	587	15,924	రె,600			2,792		25,31
FIFSU	Cutover	804	140,238	63,892					204,13
	Brush	718	707	9,037					9,74
	All Uplend	19,839	1,654,590	1,822,601	115	12,221	3,244		3,492,77
	Stream	326	186,143	13,993	2,025	33,338			235,49
	All Types		1,840,733		2,140	45,559	3,244		3,728,27
	Open Reproduction	26,334	974,139	1,533,253	3,697	13,359	6,796		2,531,24
	Dense Reproduction	939	8,773	2,526	14				11,31
	Open Pole	4,627	57,763	47,447	400	4,979	4		110,59
	Denee Pole	527	962	1,196					2,15
	Open Meture	865	44,005	14,840	460		8,951		68,25
Second	Cutover .	3,357	127,763	251,747	10,743	1,882	222		392,35
	Brush	48	71	7,985 .					8,05
	Burn	348	175,977	57,421					233,39
	All Upland	37,045	1,389,453	1,916,415	15,314	20,220	15,973		3,357,37
	Stream	1,285	190,381	7,066	29,294	22,347	658		249,74
	All Types	38,330	1,579,834	1,923,481	44,608	42,567	16,631		3,607,12
	Open Reproduction	7,964	243,371	653,227	258	7,406	14		904,27
	Dense Reproduction	110	1,326	73,525					74,85
	Open Pole	719	15,241	49,639	21	53			64,95
	Dense Pole	25	133	299					43
m : 1	Open Meture	219	45,059	16,171	8		1,728		62,96
Third	Cutover	1,504	52,123	123,324	384	7,822			183,65
	Brush	57	387	608					99
	All Upland	10,598	357,640	916,793	671	15,281	1,742		1,292,12
	Stream	645	43,429	2,794	13,145	3,477		7,090	69,93
	All Types	11,243	401,069	919,587	13,816	18,758	1,742	7,090	1,362,06
	Open Reproduction	48,658	2,644,848	3,892,124	4,070	32,968	7,262		6,581,27
	Dense Reproduction	1,096	10,808	78,992	14	18			89,83
	Open Pole	8,167	142,553	131,501	421	5,032	4		279,51
	Denee Pole	1,054	1,220	1,567					2,78
433	Open Mature	1,671	104,988	37,611	468		13,471		156,53
All	Cutover	5,665	320,124	438,963	11,127	9,704	222		780,14
Workings	Brush	823	1,165	17,630	· ·		İ		18,79
	Burn	348	175,977	57,421	_				233.39
	All Upland		3,401,683	4,655,809	16,100	47,722	20,959		8,142,27
	Stream	2,256	419,953	23,853	44,464	59,162	658	7,090	555,18
	All Types		3,821,636	4,679,662	60,564	106,884	21,617		8,697,45



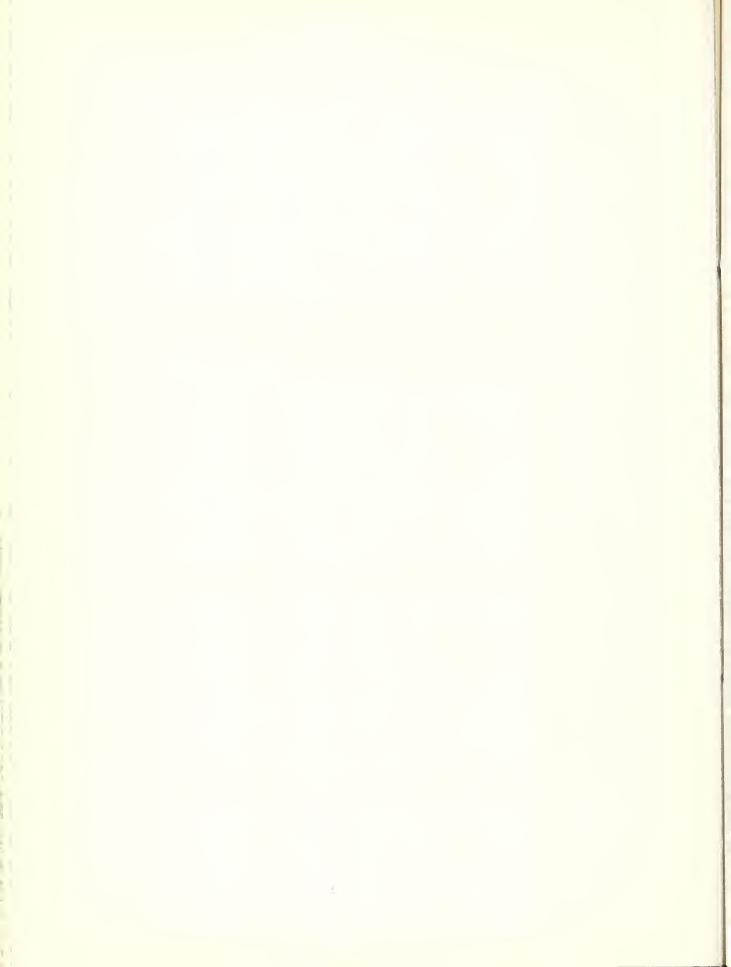
# SUMMARY OF RIBES ERADICATION, 1923-1941 INLAND EMPIRE

TABLE 7 - SUMMARY OF ALL WORKINGS

	Acree	Acrea	Acree				
	Firet	Second	Third	Total	Effective	Total	Gallons
<b>Eredication Type</b>	Working	Working	Working	Acrea	Man-Daye	Ribes	Spray
Open Reproduction		139,038		646,713		193,523,972	
Dense Reproduction	93,523	8,824		102,580			
Open Pole	282,899	57,385	3,586	343,870	169,420	28,960,006	
Denee Pole	71,638	7,861	226	79,725	18,371	2,730,989	
Open Mature	653,257	41,352	2,258	696,867	328,516	69,733,250	
Denee Mature	69,024	1,952		70,976	8,786	1,187,649	
Cutover	49,317	43,186	10,430	102,933	112,559	31,927,030	
Bruah	25,041	2,262	344	27,647	27,004	5,103,636	
Burn	10,135	937		11,072	8,785	4,174,390	
Subalpine	3,255	231	88	3,574	2,351	479,573	
Meadow-Field	2,569	10		2,579			
All Upland	1,750,318	303,038	35,180	2,088,536	1,525,556	344,560,649	
Stream (Hand)	118,431	46,647	11,670	176,748	294,007		
Stream (Chemical)	22,538	9,119	1,116	32,773	67,763	5,364,248	1,757,211
Stream (Slach)	1,578	53	40	1,671	19,489	1,008,814	
Stream (Machine)	2,150	102		2,252			
Stream (Zone)	208	4,143		4,351			
All Stream	122,322	50,945					
All Types	1,872,640	353,983	46,850	2,273,473	1,922,882	421,585,998	

#### TABLE 7A - FIRST WORKING

						Per	r Acre	Baeia
			Effective	Totel	Gallona	Man-		Gallon
Eradic	ation Type	Acree	Man-Daya		Spray		Ribea	
Open Re	production	489,660	607,204	172,029,968		1.24	351	
Dense R	eproduction	93,523	40,957	6,079,329		. 44	65	
Opan Po		282,899				.47	89	
Denae P		71,638				.21	34	
Open Ma		653,257				.46		
Denae M		69,024	8,108			.12		
Cutover		49,317	48,117			.98		
Bruah		25,041				.98	194	
Burn		10,135				.71	337	
Subalpi	20	3,255	2,170			-67		
			151		-	-07	5	
Meadow-		2,569		12,131		.06	170	
All Upl				298,124,731		.68		
Stream		118,431			2 101 07	1.84		- 0.5
	(Chemical)	22,538			1,494,216	2.38		66
	(Slach)	1,578		971,517		11.44		
	(Machine)	2,150				5.74		
Stream	(Zone)	208				1.30		
All Str	mse mse	122,322	302,614	63,463,267		2.47		
All Typ	66	1,872,640	1,489,485	361,587,998		.80	193	
Onon Po	production	139,038		SECOND WORK:		1.24	141	
						.70		
	eproduction	8,824						
Open Po		57,385				•58		
Denee P		7,861		320,120		.38		
Open Ma		41,352				-66		
Denae M		1,952				.35		
Cutover		43,186	50,899			1.18		
Brueh		2,262				.98	101	
Burn		937				1.72		
Subalpi		231				.61		
Meadow-		10	1	72		.10	7	
All Upl		303,038				.98	140	
Stream		46,647				1.31		
	(Chemical)	9,119			240,188	1.43		26
	(Slaah)	53	796			15.02		
	(Machine)	102	458			4.49	456	
Stream	(Zone)	4,143	2,998	451,769		.72	109	
All Str	eam	50,945	78,456			1.54	226	
All Typ		353,983				1.06		
			TABLE 7C -	THIRD WORKI	NG.			
	production	18,015				1.27		
	eproduction	233	240			1.03		
Open Po	le	3,586	2,603			.73		
Denee P	ole	226				.57	29	
Open Me		2,258				.68		
Cutover		10,430				1.30		
Brush		344	226			.66		
Subelpi	ne	88	39			.44	61	
All Upl		35,180				1.17	117	
Stream						1.25		
		11,670	14,607		20.00			
	(Chemical)	1,116		68,421	22,807	.90		20
	(Slaah)	40				16.05		
All Str	eam	11,670	16,256	2,060,159		1.39	177	
All Typ		46,850		6,165,606		1.23	132	



State	Working		Acres	Effactiva Man-Days	Total Rihes	Gallons Spray	Par Acra Man-Daya	Ribs
		EQ-Reg. FS-Reg.	44,572 148,208	15,195 166,346	3,913,072 43,539,809	280,205	1.12	294
	İ	EQ-NIRA FS-NIRA	61,375 270,392	37,916	13,414,672	24,200	.62 .59	219
	Firet	EQ-ERA	336,578	252,612	64,080,774 6,859,911	128,289	.75	190
		FS-ERA EQ-Coop.	34,628 219,676	34,208 104,078	30,882,002	339,769	.47	141
		F-CCC S&P-CCC	350,293 166,813	413,252 127,659	83,244,456 26,122,385	316,417 234,341	1.18	238 156
		Total FS-Rag.	1,632,535	1,311,903	319,339,461	1,436,391 48,111	- +80	196
		EQ-NIRA	105,273 2,818	107,153	13,690,025 451,021	3,355	1.02	160
		FS-NIRA EQ-ERA	16,342	7,262 96,915	966,499 17,418,364	8,007 52,956	.44	171
	Sacond	FS-ERA	14,822	12,817	1,331,686	2,044	.86	90
		EQ-Coop. F-CCC	14,986 48,816	11,013 85,412	1,266,100 8,408,081	13,632 50,451	.73 1.75	172
Ideho		S&P-CCC Total	16,301 321,102	20,998 343,458	49,176,405	51,086 229,642	1.29	285
244110		FS-Reg.	14,525	17,252	1,692,582	6,849	1.19	113
		FS-NIRA EQ-ERA	914	747 14,769	127,700	1,922 5,135	1.19	140
	Third	FS-ERA EQ-Coop.	2,551	2,616	68,599 457,858	348	1.03	179
		F-CCC	7,335	13,437	1,141,601	5,008	1.83	156
		S&P-CCC Total	856 39,379	935 50,325	169,098	19,262	1.09	196
		EQ-Reg. FS-Rag.	44,572 268,006	15,195 290,751	3,913,072 58,922,416	335,165	1.08	220
		EQ-NIRA	64,193	39,804	13,865,693	27,555	.62	216
	All	FS-NIRA EQ-ERA	287,648 450,749	168,646 364,296	48,376,579 83,008,876	123,099 186,380	.59	168
	Workinge	FS-ERA EQ-Coop.	50,221 237,213	47,594 117,707	8,260,196 32,605,960	2,392 353,401	.95	164
		F-CCC	406,444	512,101	92,794,138	371,876	1.26	228
		S&P-CCC Total	183,970 1,993,016	149,592	30,935,102 372,692,032	285,427 1,685,295	.81	169
		FS-Reg. EQ-NIRA	12,564 26,733	11,265 11,711	4,691,869 4,349,259		.90	373
	First	FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA F-CCC	21,423 19,741	35.181	10,074,443		1.64	165
		Total FS-Reg.	19,741 114,878 8,082	21,426 92,291 4,549	26,227,469 1,360,710		.80 .56	228
		EQ-ERA	11,920	12,212	2,634,166		1.02	221
	Second	FS-ERA F-CCC	1,949 2,587	1,678 3,279	154,764 232,829		.86 1,27	90
Washington		Total FS-Reg.	24,538 633	21,718	4,392,469 75,265		.99	179
	Third	EQ-ERA	4,631	4,036	768,915		.86	164
		Total FS-Reg.	5,314 21,279	4,252 16,030	844,180 6,127,843		.80	159
		EQ-NIRA FS-NIRA	26,733	11,711	4,348,259		.44	163
	All Workings	EQ-ERA	34,417 38,024	12,708 51,429	3,859,496 13,477,524		1.35	354
	MOTETURS	FS-ERA F-CCC	1,949 22,328	1,678 24,705	154,764 3,487,233		.86 1.11	156
		Total	144 730	118,261	31,454,118	70.005	.82	217
		EQ-Reg. FS-Reg.	12,524	2,315 11,392	462,300 1,653,529	30,665 2,452	1.67	132
		EQ-NIRA FS-NIRA	21,773 22,215	8,027 16,789	2,158,067 4,684,242	10,417	.76	211
	First	EQ-ERA	42,313	20,386	3,292,671	1,330 10,181	, 49	78
		FS-ERA F-CCC	11,247 13,772	16,299 10,083	2,473,391 1,296,868		1.45	94
		Total EQ-Reg.	125,227	85,291 980	16,021,068 299,410	57,825 4,130	.69 1.58	128
		FS-Reg.	3,604	3,537	341,025	5,376	.98	95
	Sacond	FS-ERA FS-ECC	1,342 2,100	1,597 2,464	265,637	1,040	1.19	198
Montana		F-CCC Total	678 8,343	2,174	163,427	10,546	3.21	241 153
20200		FS-Rag.	1,334	1,864	78,437		1.40	59
	Third	EQ-ERA FS-ERA	648 150	777 68	59,040		1.20	91
		F-CCC Total	25 2,157	183 2,892	11,714 155,260	3,545	7.32	469
		EQ-Reg.	2,002	3,295	761,710	3,545 34,795	1.65	380
		FS-Reg. EQ-NIRA	17,462 21,773	16,793 8,027	2,072,991	7,828	.96	119 99
	All Workings	FS-NIRA	22,215 44,303	16,789 22,760	4,684,242 3,617,348	10,417	-76 -51	211
		FS-ERA	13,497	18,831	2,683,481	11,221	1,40	199
		F-CCC Total	14,475 135,727	12,440 98,935	1,472,009	6,325 71,916	.86	102
		EQ-Reg. FS-Reg.	45,955 173,296	17,510 189,003	4,375,372 49,885,206	30,665 282,657	1.09	95 286
		EQ-NIRA	109,881	57,654	19,920,997	24,200	-52	181
	First	FS-NIRA EQ-ERA	327,024 400,314	190,134 308,179	55,825,118 77,447,998	123,587 129,619	.58	171
	TITSU	FS-ERA EQ-Coop.	45,875 219,676	50,507 104,078	9,333,302	10,191 339,769	1.10	203
		F-CCC	383,806	444,761	87.795.728	319,197	1.16	229
		S&P-CCC Total	166,813 1,872,640	127,659 1,489,485	26,122,395 361,587,998	234,341 1,494,216	.77	156
		EQ-Reg. FS-Reg.	619 116,959	980 115,239	299,410 15,391,760	4,130 53,487	1.58	484 132
		EQ-NIRA	2,818	1,888	451,021	3,355	.67	160
	Sacond	FS-NIRA EQ-ERA	16,342	7,262	966,499	8,007 52,956	.44	177
	Pecond	FS-ERA EQ-Coop.	18,871 14,986	16,959	1,690,471	3,084 13,632	.90	90
Idaho		F-CCC	52,091	11,013 90,865	1,266,100 8,804,337	50,451	1 7/	169
Washington Montana		S&P-CCC Total	16,301 353,983	20,998 375,928	4,644,629 53,832,394	51,086 240,188	1.29	285
		FS-Rag.	16,492	19,332	1,846,294	6,849	1.17	112
		FS-NIRA EQ-ERA	914 17,756	747 19,592	127,700 2,337,693	1,922 5,135	.92 1.10	132
	Third	FS-ERA EQ-Coop.	921 2,551	637 2,616	74,668 457,858	348	1.03	179
		F-CCC	7,360	13,620	1,153,315	8,553	1.85	157
		Total	856 46,850	57,469	6,165,606	22,807	1.09	196
		EQ-Rag.	46,574	18,490	4,674,782	34,795	.40	100
		FS-Reg. EQ-NIRA	306,747 112,699	323,574 59,542	67,123,250 20,372,018	342,993 27,555	1.05	219
	All	FS-NIRA	344,280	198,143	56,919,317 100,103,748	133,516	.58	165
	Workings	EQ-ERA FS-ERA	533,076 65,667	438,485 68,103	11,098,441	187,710 13,613	1.04	169
		EQ-Coop.	237,213	117,707 549,246	32,605,960 97,753,380	353,401 378,201	1.24	137 221
					30,935,102	285,427 1,757,211	.81	168



TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1941
INLAND EMPIRE

		Ĭ.	Number of Acres Worked by								
				ership Clas	sses						
			Federal								
		Forest	Public								
State	Working	Service	Domain	Total	State	Private	Total				
	First	862,699	16,482	879,181	263,749	489,605	1,632,535				
Tanha	Second	180,545	5,325	185,870	42,966	92,266	321,102				
Idaho	Third	19,404	142	19,546	7,244	12,589	39,379				
	Total	1,062,648	21,949	1,084,597	313,959	594,460	1,993,016				
	First	68,053	315	68,368	6,832	39,678	114,878				
Washington	Second	12,950	60	13,010	3,935	7,593	24,538				
Mashington	Third	633		633	2,114	2,567	5,314				
	Total	81,636	375	82,011	12,881	49,838	144,730				
	First	103,396		103,396	696	21,135	125,227				
Manhone	Second	6,376		6,376		1,967	8,343				
Montana	Third	897		897		1,260	2,157				
	Total	110,669		110,669	696	24,362					
	First	1,034,148	16,797	1,050,945	271,277	550,418	1,872,640				
Total	Second	199,871	5,385	205,256	46,901	101,826	353,983				
Total	Third	20,934	142	21,076	9,358	16,416	46,850				
	Total	1,254,953	22,324	1,277,277	327,536	668,660	2,273,473				

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1941
INLAND EMPIRE

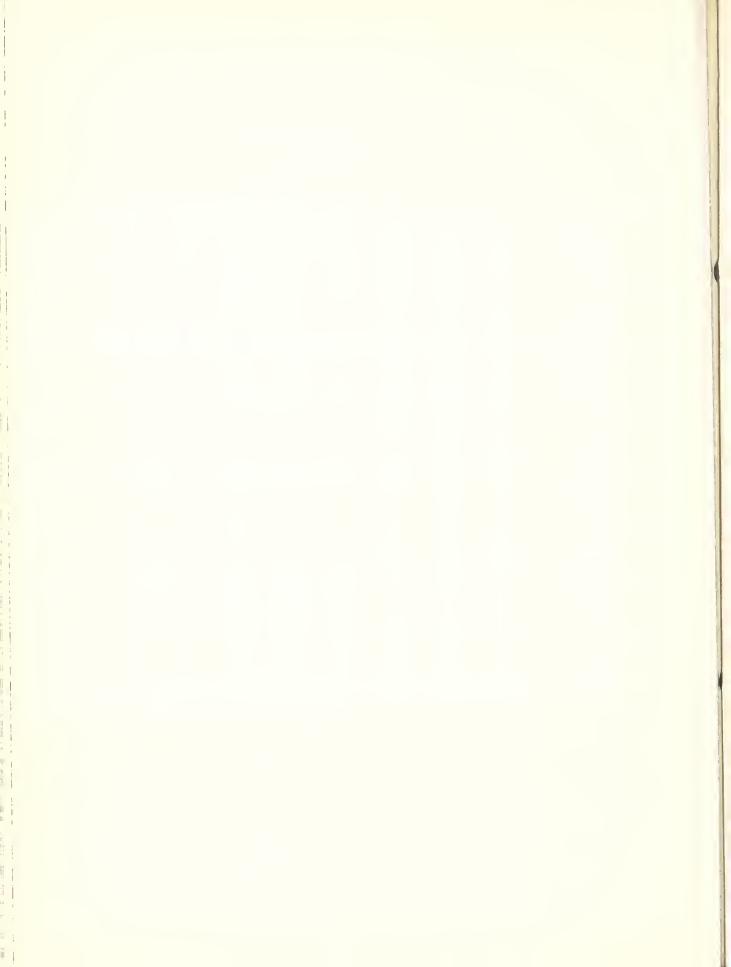
					Acres Mature	
					Stands on	
		Nin	mber of A	77760	Which Working	Total Acres
State	Ownership Class	Worked	Unworked		Is Deferred	White Pine
Buate	Ownership Oldss	WOIREG	OHWOIREG	Total	15 Defeiled	white line
	Forest Service	862,699	210,937	1,073,636	56,454	1,130,090
	Public Domain	16,482	14,068	30,550	1,040	31,590
Idaho	Subtotal Federal	879,181	225,005	1,104,186	57,494	1,161,680
Idano	State	263,749	49,091	312,840	32,110	344,950
	Private	489,605	215,488	705,093	95,932	801,025
	Total	1,632,535	489,584	2,122,119	185,536	2,307,655
	Forest Service	68,053	31,257	99,310		99,310
	Public Domain	315		315		315
We all do on an	Subtotal Federal	68,368	31,257	99,625		99,625
Washington	State	6,832	3,018	9,850		9.850
*	Private	39,678	11,942	51,620		51,620
	Total	114,878	46,217	161,095		161,095
	Forest Service	103,396	46,423	149,819	13,706	163,525
Montana	State	696	234	930		930
Montana	Private	21,135	12,660	33,795	2,490	36,285
	Total	125,227	59,317	184,544	16,196	200,740
	Forest Service	1,034,148	288,617	1,322,765	70,160	1,392,925
	Public Domain	16,797	14,068	30,865	1,040	31,905
Total	Total Subtotal Federa		302,685	1,353,630	71,200	1,424,830
TOTAL	State	271,277	52,343	323,620	32,110	<b>3</b> 55,730
	Private	550,418	240,090	790,508	98,422	888,930
	Total	1,872,640	595,118	2,467,758	201,732	2,669,490

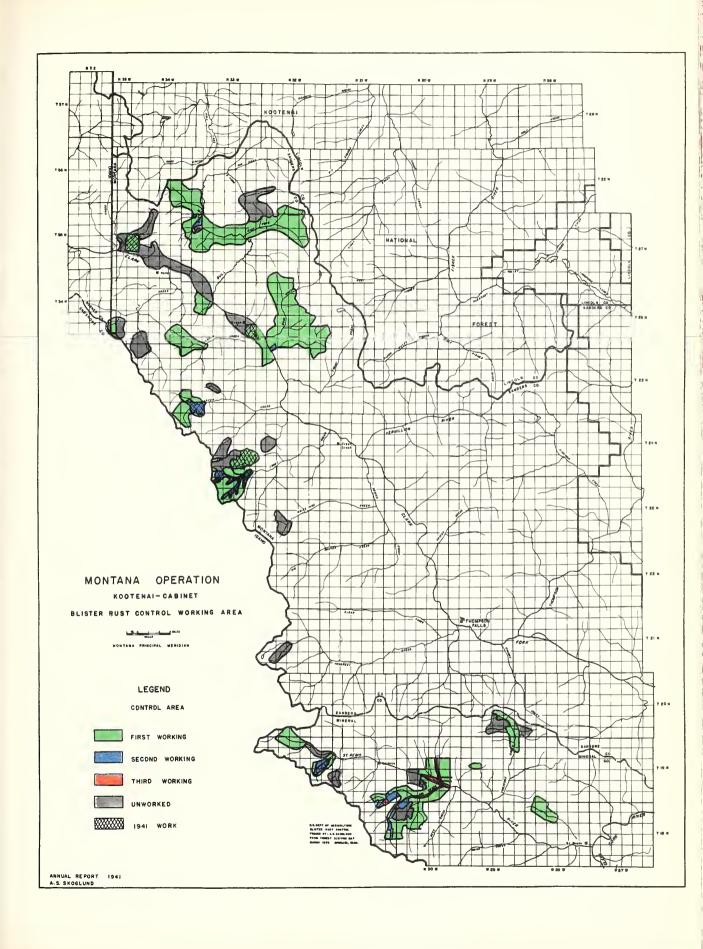


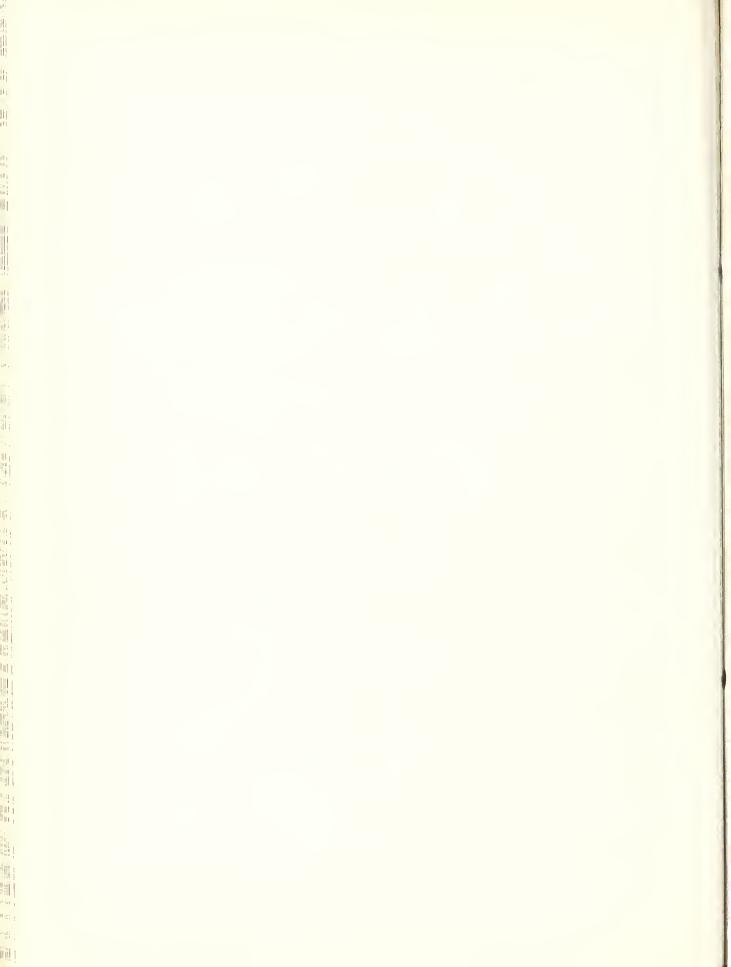
TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1941
INLAND EMPIRE

						Ribes by S	pecies				
			Ribes	Ribes	Ribes	Ribes	Ribee	Ribee	Ribes	Ribes	Totel
Working	Eredicetion Type	Acres	lecustre	viscosissimum	petiolere	inerme	irriguum	coloredense	triste		Ribes
	Open Reproduction	489,660	46,033,623	124,259,898	180,707	1,083,653		1,176	1,145		172,029,968
į	Dense Reproduction		3,159,762	2,762,059	15,767	104,649	34,813	2,279			6,079,329
[	Open Pole	282,899	12,549,907	11,899,122	63,582	349,667	223,045		462	3,914	25,089,69
[	Dense Pole	71,638	1,471,792	884,224	1,651	36,301	10,420				2,404,38
	Open Meture	653,257	43,065,928	21,964,261	225,205	363,002	472,978	7,069	26	2,027	66,100,49
[	Dense Meture	69,024	818,347	249,393	1,104	42,382	2,839	188			1,114,25
	Cutover	49,317	5,868,511	10,517,398	43,873	90,333	38,795				16,558,910
First	Brush	25,041	1,522,994	3,196,630	19,257	97,116	20,835				4,856,83
	Burn	10,135	706,582	2,671,736	8,895	18,433	9,292				3,414,938
-	Subelpine	3,255	326,851	136,917		19					463,787
Ī	Meedow-Field	2,569	5,010			7,121					12,131
F	All Uplend	1,750,318	115,529,307	178,541,638	560,041	2,192,676	1,282,783	10,712	1,633	5,941	298,124,73]
	Stream	122,322	41,914,780	2,004,363		13,042,708	116,220	31,905	21,255	19,584	63,463,267
ŀ	All Types		157,444,087	180,546,001		15,235,384		42,617	22,888	25,525	361,587,998
	Open Reproduction	139,038	6,613,264	12,768,255	51,492	96,492	31,032	,	2,591	,	19,563,126
-	Dense Reproduction		369,515	171,980	18	1,627	83		2,001		543,223
-	Open Pole	57,385	1,784,811	1,685,370	19,108	35,956	1,740				3,526,985
ŀ	Dense Pole	7,861	239,158	74,241	3,960	2,761	1,720				320,120
ŀ	Open Meture	41,352	1,845,895	1,515,832	16,546	14,440	35,934		267		3,428,914
-	Dense Meture	1,952	59,675	12,838	10,540	658	225		201		73,396
-	Cutover	43,186	3,235,585	10,528,593	77,475	24,417	10,777				
Second	Brush	2,262	68,574	158,449	11,415	875	10,777			<u> </u>	13,876,847
}	Burn	937	287,197		5 447	875					227,898
}		231		466,808	5,447						759,458
	Subelpine		5,431	5,007							10,438
	Meedow-Field	10									72
	All Uplend	303,038		27,387,373	174,046	177,226	79,791		2,858		42,330,471
	Stream	50,945			1,943,990		32,190		154,711		11,501,923
	All Types	353,983			2,118,036		111,981		157,569		53,832,394
	Open Reproduction	18,015	785,968	1,127,758	7,726	9,212	214				1,930,878
	Dense Reproduction	233		79,365							105,399
	Open Pole	3,586		157,697	38	53	6				343,322
ļ	Denee Pole	226	5,885	596							6,481
_	Open Meture	2,258	149,443	52,661	8		1,728				203,840
Third [	Cutover	10,430	663,601	805,188	14,519	7,822	143				1,491,273
1	Brush	344	5,302	13,604							18,906
- 1	Subelpine	88	2,510	2,838							5,348
į.	All Uplend	35,180	1,824,271	2,239,707	22,291	17,087	2,091				4,105,447
[	Stream	11,670		30,737	528,598	482,453			9,472		2,060,159
	All Types	46,850		2,270,444	550,889	499,540	2,091		9,472		6,165,606
	Open Reproduction	646,713		138,155,911	239,925	1,189,357	501,012	1,176	3,736		193,523,972
	Dense Reproduction	102,580	3,555,311	3,013,404	15,785	106,276	34,896	2,279			6,727,951
	Open Pole	343,870		13,742,189	82,728	385,676	224,791		462	3,914	28,960,006
	Dense Pole	79,725	1,716,835	959,061	5,611	39,062	10,420				2,730,989
	Open Meture	696,867	45,061,266	23,532,754	241,759	377,442	510,640	7,069	293	2,027	69,733,250
	Dense Meture	70,976	878,022	262,231	1,104	43,040	3,064	188			1,187,649
All	Cutover	102,933	9,767,697	21,851,179	135,867	122,572	49,715				31,927,030
Workings	Brush	27,647	1,596,870	3,368,683	19,257	97,991	20,835				5,103,636
2	Burn	11,072	993,779	3,138,544	14,342	18,433	9,292				4,174,390
	Subelpine	3,574	334,792	144,762		19					479,573
	Meedow-Field	2,579	5,082	,		7,121	·				12.203
	All Uplend		131,862,755	208,168,718	756,378	2,386,989	1,364,665	10,712	4,491	5,941	344,560,649
	Stream	184,937				15,479,940			185,438	19,584	77,025,349







# BLISTER RUST CONTROL WORK, MONTANA OPERATION, 1941

C. H. Johnson, Associate Pathologist, U. S. Forest Service A. S. Skoglund, Assistant Pathologist

### INTRODUCTION

During 1941, the Montana operation blister rust control activities were confined to the Cabinet National Forest. The project consisted of three regular camps, one ERA camp and part of one CCC camp. Although prolonged rainy weather tended to slow up operations in late summer and contributed to the early closing of camps, careful and systematic planning of the efforts resulted in completion of the control work scheduled.

### ORGANIZATION AND ADMINISTRATION

The first camp was established on April 14 and the last camp on July 5, which was after the 1942 fiscal year funds were available. The camps were discontinued between September 12 and October 15.

Blister rust control personnel of the Bureau of Entomology and Plant Quarantine and the U. S. Forest Service worked in close cooperation toward the efficient conduct of the work. Field headquarters were established in conjunction with a regular camp located on Marten Creek near Tuscor, Montana.

### LOCATION AND DESCRIPTION OF AREAS

All of the regular and relief workers were concentrated on the Trout Creek and Marten Creek drainages. Other areas worked were Rainy Creek, the Savenac Nursery Protection Zone, Blue Creek and lower Pilgrim Creek.

The Trout Creek area, which is composed entirely of reproduction type on burned-over land, had heavy concentrations of ribes in the upper Trout Creek and the South Fork of Trout Creek portions while the remainder supported relatively light populations. About one half of the area was first working while the balance was worked for the second time. The area worked on Marten Creek was all second working in reproduction type on logged-over lands. On this area all degrees of ribes populations were encountered though the greater portion was relatively light. Very excellent stands of young white pine are growing on both of these areas.

CCC enrollees located at Haugan, Montana, performed second working on the Rainy Creek unit and first working on the northeast slope of the Haugan Lookout area. Heavy ribes concentrations were encountered in both of these areas.

The stream type in the Savenac Nursery protection zone was worked very intensively by a crew of checkers. With but one or two exceptions the ribes were very scattered.

The Pilgrim Creek and Blue Creek areas required very little work since the advance survey showed only three or four patches of ribes on the two areas.

# METHODS AND EQUIPMENT

Standard grubbing and spraying methods were used throughout the season. Special emphasis was placed on the systematic training of new men which resulted in increased production. In addition the mop-up men were carefully selected and trained in order to increase the effectiveness of their work.

# CHECKING AND PINE DISEASE SURVEY

In the spring of 1941 a small amount of infection was found in the planting stock being shipped and the transplant stock being moved from seedbeds. Data on the total amount of this were not obtained but it is known to be a relatively small percentage. A further inspection in August of about 10,000 of the transplants failed to disclose any infection, and some of these inspections were made in the identical beds that previously had contained infected stock.

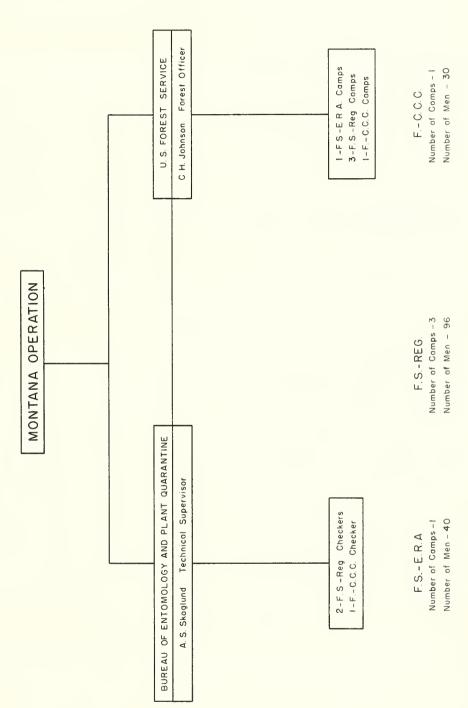
The stream type in the Savenac Nursery protection zone was checked very intensively during 1941 by a crew of three checkers. To secure a satisfactory sample of the very low ribes population, remaining in most of the extensive and brushy stream type, considerable searching was done. In addition a careful check was made for the disease on the young native white pine. These trees growing in the stream type adjoining the nursery are practically rustfree, only two cankers having been found.

The upland type in the immediate vicinity of the nursery is generally ribesfree and only occasionally can a canker be found except in the upper part of
the old nursery where scattered Pinus albicaulis are encountered. The white
pines under Haugan Lookout are about five per cent infected though most of the
scattered P. albicaulis are infected. This area which is on the southwest
extremity of the nursery protective zone contains approximately 800 Ribes
viscosissimum per acre and needs to be worked in a most thorough manner during
1942 in order to prevent a large build-up of infection. This immediate work
in addition to further work of several small areas and a small amount of
angual maintenance work thereafter should afford satisfactory blister rust
protection to the nursery.

The reproduction in the Rainy Creek drainage is badly infected with both branch and trunk cankers. The initial work toward control done in 1934 was ineffective due to the persistence of large quantities of the original masses of R. petiolare and R. triste. As a result heavy infection developed, especially in 1937, until about 20 per cent of the pine has become infected. Fortunately, much of the infection in the upland zone is confined to the branches so pruning, along with ribes eradication, was undertaken. The area is in a damp locality very favorable for the spread of blister rust, but it is also an excellent site for white pine. Additional work is urgent if the fine stand of reproduction is to reach maturity.

In the Marten Creek drainage only isolated and scattered pine infection was found with most of this in the stream zone and damp sites. The build-up of rust should be somewhat slow and if the necessary rework of several remaining small areas is completed, little damage may be expected.

# ORGANIZATION CHART



Total Number of Men on Blister Rust Work - 166



No pine infection was found during 1941 in the extensive Trout Creek planted area. The only infection found in this area to date is one canker located in 1940. Several small areas of seedling R. viscosissimum that germinated during planting operations need to be eliminated to put the area in a satisfactory condition.

There is about five per cent infection mostly limb cankers, along the West Fork of Trout Creek in an area which extends from three to eight chains up the south slope between Atterbury Creek and the South Branch. This area was worked in 1941 and will require one more working to establish protection. Above the South Branch only occasional cankers were found these occurring either in the stream type or in the heavy R. viscosissimum concentration at the head of the basin. These R. viscosissimum were heavily infected in 1941 making it essential that they be removed without delay.

The Blue Creek and Pilgrim Creek areas worked during 1940 and 1941 are on a maintenance basis and need no additional work. Four cankered trees were removed from the Pilgrim Creek area but the removal of all ribes should stop any further spread.

The total amount of regular checking performed during 1941 was 5,483 acres. The average cost per acre for this was \$0.078.

# CANKER ELIMINATION

The pruning work performed by an ERA crew on Big Creek during the fall of 1940 greatly reduced aeciospore production in that vicinity in addition to saving many trees that would have been killed by growing branch cankers. The several branch excisions per tree appeared to have retarded average height growth only slightly, if at all. There were some increases in height growth possibly due to the elimination of considerable lateral growth. The lower limbs were removed by the use of hand pruning shears and saws to a height equalling two fifths of the distance from the base of the tree to the top. At the present rate of recovery there will be a complete heal-over of all cuts by the end of the third year after pruning.

Pruning work was continued by the CCC enrollees from Haugan during the winter and spring of 1940 to 1941 on a 50-acre plantation on Big Creek. In addition they pruned the trees in a five to ten chain wide strip of stream bottom and slope area for the length of the control unit in Rainy Creek.

# STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs by cooperative agency and type of appropriation is shown in the following tabulations:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941

MONTANA OPERATION

Cooperating Agency	Appropriation	Amount
	Regular	\$33,936.00
Forest Service	ERA	5,421.00
	Total	39,357.00
Bureau of Entomology		
and Plant Quarantine	Regular	2,945.50
All Agencies	Total	\$42,302.50

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941

MONTANA OPERATION

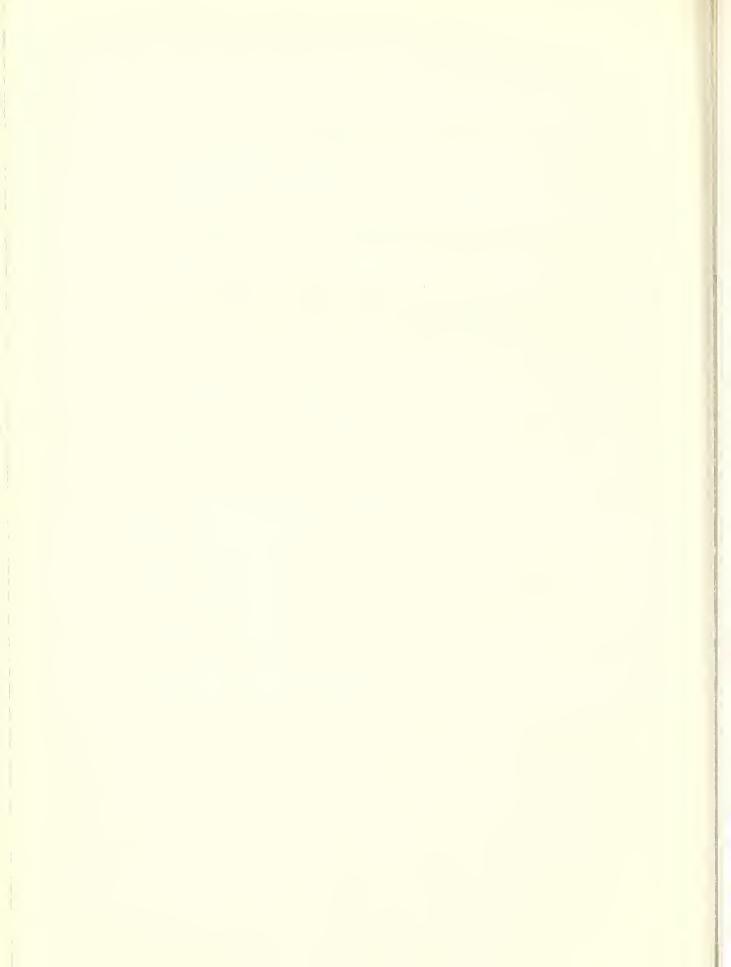
	Foi	est Servi	;e	Bureau of Entomology and Plant Quarantine	
Item	Regular	ERA	Total	Regular	Total
Sal., perm. men	\$ 3,506.00		\$ 3,506.00	\$2,700.00	\$ 6,206.00
Sal., temp. men	4,733.00	\$ 183.00	4,916.00		4,916.00
Wages, temp. labs.	18,162.00	2,942,00	21,104.00		21,104.00
Subs. supplies	4,586.00	2,004.00	6,590.00		6,590.00
Equipment	1,133.00	161.00	1,294.00		1,294.00
Trucks	696.00	58.00	754.00		754.00
Travel and Transp.	376.00	58.00	434.00	236.20	670.20
Chemicals	332.00		332.00		332.00
Twine	236.00		236.00		236.00
Other supplies	176.00	15.00	191.00	9.30	200.30
Total	\$33,936.00	\$5,421.00	\$39,357.00	\$2,945.50	\$42,302.50

TABLE 2A

# DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS MONTANA OPERATION

Program	Number of Effective Man-Days	Expe	nditures ng to Fund	Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 2,945.50	
FS-Reg.			33,936.00	\$ 8.65
FS-ERA	524	FS-ERA	5,421.00	10.35
CCC	1,595	CCC fund	is not inclu	ıded
Total Cost of 1941 Progr	ram		\$42,302.50	

Number of meals served 26,524 Average cost per meal \$0.248 Pounds of twine used 460 Pounds of chemical used 5,000



# SUMMARY OF RIBES ERADICATION, 1941 MONTANA OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

						1				
		Acres	Acres	Acres					Ribes	Remaining
		First	Second	Third	Total	Effective	Total	Gallons	Per	Acre
Forest	Eradication Type	Working	Working	Working	Acres	Man-Days	Ribes	Spray	Bushes	Live Stem
	Open Reproduction	1,962	1,869		3,831	4,606	515,408		5.3	13.6
	Open Pole	1,680			1,680	8	422		0	0
	Brush	718			718	149	9,744		.8	5.5
Cabinet	All Upland	4,360	1,869		6,229	4,763	525,574		3.9	10.7
	Stream (Hand)	45	211		256	720	73,166		9.3	27.6
	Stream (Chemical)			12	12	148	10,635	3,545		
	All Stream	45	211		256	868	83,801		9.3	27.6
	All Types	4,405	2,080		6,485	5,631	609,375		4.2	11.6
_	Open Reproduction	114		25	139	361	34,157		2.4	8.5
Savenac	Stream (Hand)			282	282	51	1,213			
Nursery	All Types	114		307	421	412	35,370		2.4	8.5
	Open Reproduction	2,076	1,869	25	3,970	4,967	549,565		5.2	13.4
	Open Pole	1,680			1,680	8	422		0	0
	Brush	718			718	149	9,744		.8	5.5
All	All Upland	4,474	1,869	25	6,368	5,124	559,731		3.9	10.6
Forests	Stream (Hand)	45	211	282	538	771	74,379		9.3	27.6
	Stream (Chemical)			12	12	148	10,635	3,545		
	All Stream	45	211	282	538	919	85,014		9.3	27.6
	All Types	4,519	2,080	307	6,906	6,043	644,745		4.2	11.4

TABLE 3A - FIRST WORKING

			Effective	Total	Gallons	Per Man-	Acre	Basis Gallons		Remaining Acre
Forest	Eradication Type	Acres	Man-Days	Ribes	Spray	Days	Ribes	Spray	Bushes	Live Stem
	Open Reproduction	1,962	2,038	264,131		1.04	135		3.9	9.4
	Open Pole	1,680	8	422		.01	1		0	0
0 3.	Brush	718	149	9,744		.21	14		.8	5.5
Cabinet	All Upland	4,360	2,195	274,297		.50	63		2.7	7.2
	Stream (Hand)	45	148	23,471		3.29	522		9.3	27.6
	All Types	4,405	2,343	297,768		.53	68		3.1	8.5
Savenac										
Nursery	Open Reproduction	114	326	33,078		2.86	290		2.5	9.8
	Open Reproduction	2,076	2,364	297,209		1.14	143		3.8	9.5
	Open Pole	1,680	8	422		.01	1		0	0
All	Brush	718	149	9,744		.21	14		.8	5.5
Forests	All Upland	4,474	2,521	307,375		.56	69		2.7	7.3
	Stream (Hand)	45	148	23,471		3.29	522		9.3	27.6
	All Types	4,519	2,669	330,846		. 59	73		3.1	8.5
			TABLE :	BB - SEC	OND WORK	ING				
	Open Reproduction	1,869	2,568	251,277		1.37	134		8.6	23.2
Cabinet	Stream (Hand)	211	572	49,695		2.71	236			
	All Types	2,080	3,140	300,972		1.51	145		8.6	23.2
					RD WORKIN					
Cabinet	Stream (Chemical)	12	148	10,635	3,545	12.33	886	295		
Savenac	Open Reproduction	25	35	1,079		1.40	43		2.1	2.1
Nursery	prieam (manu)	282	51	1,213		.18	4			
Hui sery	All Types	307	86	2,292		.28	7			
	Open Reproduction	25	35	1,079		1.40	43		2.1	2.1
All	Stream (Hand)	282	51	1,213		.18	4			
Forests	Stream (Chemical)	12	148	10,635	3,545	12.33	886	295		
1010303	All Stream	282	199	11,848		.71	42			
	All Types	307	234	12,927		.76	42			



# SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941 MONTANA OPERATION

					Γ			4,		
						I	er Ac	re Basis	Ribes	Remaining
			Effective	Total	Gallons	Man-		Gallons P	er Pe	r Acre
Working	Class	Acres	Man-Days	Ribes	Spray	Days	Ribes	Sprayed Ar	ea Bushes	Live Stem
	FS-ERA	537	516	90,551		.96	169		3.7	7.9
D:	FS-Reg.	3,868	1,827	207,217		.47	54		2.9	8.5
First	F-CCC	114	326	33,078		2.86	290		2.5	9.8
	Total	4,519	2,669	330,846		.59	73		3.1	8.5
	FS-ERA	20	8	1,289		.40	64		13.7	20.0
C3	FS-Reg.	1,784	2,046	189,719		1.15	106		8.6	21.1
Second	F-CCC	276	1,086	109,964		3.93	398		8.3	29.1
	Total	2,080	3,140	300,972		1.51	145		8.6	23.2
	FS-Reg.	282	51	1,213		.18	A			
Third	F-CCC	25	183	11,714	3,545	7.32	469	295	2.1	2.1
	Total	307	234	12,927	3,545	.76	42	295		
	FS-ERA	557	524	91,840		.94	165		3.9	8.1
All	FS-Reg.	5,934	3,924	398,149		.66	67		4.1	11.1
Workings	F-CCC	415	1,595	154,756	3,545	3.84	373	295	6.2	21.6
	Total	6,906	6,043	644,745	3,545	.88	93	295	4.2	11.4

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941

MONTANA OPERATION

Forest	Working	Number of Adby Forest Foreat Service	Service	
	First	3,276	1,129	4,405
Cabinet	Second	2,071	9	2,080
	Total	5,347	1,138	6,485
	First	114		114
Savenac Nursery	Third	123	184	307
	Total	237	184	421
	First	3,390	1,129	4,519
All Forests	Second	2,071	9	2,080
AII TOTOSOS	Third	123	184	307
	Total	5,584	1,322	6,906

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
MONTANA OPERATION

				Ribes by Species							
			Ribes	Ribes	Ribes	Ribes	Ribes	Ribes	Total		
Working	Eradication Type	Acres	lacustre	viscosissimum	petiolare	inerme	irriguum	triste	Ribes		
	Open Reproduction	2,076	145,312	151,897					297,209		
	Open Pole	1,680	10	412					422		
Dinet	Brush	718	707	9,037					9,744		
First	All Upland	4,474	146,029	161,346					307,375		
	Stream	45	21,765	1,706					23,471		
	All Types	4,519	167,794	163,052					330,846		
	Open Reproduction	1,869	216,188	34,994			95		251,277		
Second	Stream	211	46,951	2,078	8		658		49,695		
	All Typea	2,080	263,139	37,072	8		753		300,972		
	Open Reproduction	25	178	901					1,079		
Third	Stream	282	73		3,587	1,098		7,090	11,848		
	All Types	307	251	901	3,587	1,098		7,090	12,927		
	Open Reproduction	3,970	361,678	187,792			95		549,565		
	Open Pole	1,680	10	412					422		
All	Brush	718	707	9,037					9,744		
Workings	All Upland	6,368	362,395	197,241			95		559,731		
	Stream	538	68,789	3,784	3,595	1,098	658	7,090	85,014		
	All Types	6,906	431,184	201,025	3,595	1,098	753	7,090	644,745		





# SUMMARY OF RIBES ERADICATION, 1928-1941 MONTANA OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

		Acres	Acres	Acres		T		
		First	Second	Third	Total	Effective		Gallons
Forest	Eradication Type	Working	Working	Working	Acres	Man-Days	Ribes	Spray
	Open Reproduction	9,552	261		9,813		950,047	
	Dense Reproduction	2,952			3,032	1,357	151,792	
	Open Pole	15,219	779		15,998	7,599	836,364	
	Dense Pole	3,665			3,665	231	15,607	
	Open Mature	7,819			7,819	3,081	433,339	
	Dense Mature	8,608			8,608	458	48,580	
Kootenai	Brush	235			235	94	7,956	
	Burn	115			115	1	32	
	Meadow-Field	103			103	1		
	All Upland	48,268			49,388		2,443,717	
	Stream (Hand)	3,050			3,583	8,982	1,277,034	
	All Types	51,318			52,971		3,720,751	
	Open Reproduction	25,778		394	30,198	31,148	5,758,124	
	Dense Reproduction			034	1,612		71,747	
	Open Pole	20,963		38			1,524,874	
	Dense Pole			12	21,439			
		2,619	153	12	2,784		211,681	
	Open Mature	8,740	12		8,752		1,057,218	
	Dense Mature	557			557	88	8,566	
0-1:+	Brush	3,481			3,481	2,044	583,683	
Cabinet	Meadow-Field	348		444	348	150	12,131	
	All Upland	64,098		444	69,171	47,647	9,228,024	
	Stream (Hand)	3,717	920	72	4,709	12,440	2,970,760	85.054
	Stream (Chemical)	465	111	12	588	1,594	106,962	35,654
	Stream (Slash)	23			23	215	11,500	
	Stream (Machine)	75	000		75	644	39,500	
	All Stream	3,815		72	4,807	14,893	3,128,722	
	All Types	67,913		516	73,978	62,540	12,356,746	
	Open Reproduction	4,806	164	25	4,995	1,259	401,125	
	Dense Reproduction		7.21		102	3		
	All Upland	4,908	164	25	5,097	1,262	401,125	
	Stream (Hand)	1,088	962	1,616	3,666	4,177	724,925	
	Stream (Chemical)	239	62		301	880	200,801	36,262
Savenac	Stream (Slash)	45		40	85	810	42,500	
Nursery	Stream (Machine)		15		15	36	3,000	
	All Stream	1,088	977	1,616	3,681	5,903	971,226	
	All Types	5,996		1,641	8,778	7,165	1,372,351	
	Open Reproduction	40,136		419	45,006	39,833	7,109,296	
	Dense Reproduction		80		4,746	1,798	223,539	
	Open Pole	36,182		38	37,437	16,038	2,361,238	
	Dense Pole	6,284		12	6,449		227,288	
	Open Mature	16,559			16,571	7,455	1,490,557	
	Dense Mature	9,165			9,165	546	57,146	
	Brush	3,716			3,716	2,138	591,639	
All	Burn	115			115	1	32	
Forests	Meadow-Field	451			451	151	12,131	
	All Upland	117,274		469	123,656	69,157	12,072,866	
	Stream (Hand)	7,855		1,688	11,958	25,599	4,972,719	
	Stream (Chemical)	704	173	12	889	2,474	307,763	71,916
	Stream (Slash)	68		40	108	1,025	54,000	
	Stream (Machine)	75	15		90	680	42,500	
	All Stream	7,953		1,688	12,071	29,778	5,376,982	
	All Types	125,227	8,343	2,157	135,727	98,935	17,449,848	

Foreet	Ersdication Type	Acres	Effective Man-Deys	Totel Ribes	Cellons Sprey	Men-	Ribss	Gello Spre
	Open Reproduction	9,552	7,262	924,592		.76	97	
	Dansa Reproduction Open Pols	2,952	1,356	151,725 795,874		.46	51 52	
	Dense Pole Open Meture	3,665 7,819	231 3,081	15,607		.06	4 55	
Kootenai	Daniel Making	8,608	458	433,339 48,580		.05	6	
roocenat	Brush Burn	235 115	94	7,956		.40	34	
	Mesdow-Field	_103	1			.01		
	Mesdow-Field All Upland Stream (Hand) All Types	3,050	19,476 8,177	2,377,705 1,214,159		.40 2.68	398	
	All Types	51,318	27,653	3,591,864		.54	70	
	Open Reproduction Dense Reproduction	25,778	25,178 438	5,097,331 71,747		.98	198	
	Open Pols	20,963	8,011	1,485,860		.38	71	
	Dense Pole Open Meture	2,619 8,740	901 4,359	208,827 1,055,762		.34	80 121	
	Dense Meture	557	88	8,566		.16	15	
Cebinet	Brush Meedow-Field	3,481	2,044 150	583,683 12,131		.59	168 35	
	Meedow-Field All Uplend Stream (Hand)	64,098	41,169 10,729	12,131 8,523,907		.64	133 761	
	Stream (Chemicel)	465	1,180	2,828,039	25,693	2.54	166	55
	Stream (Slesh) Stream (Machina)	23 75	215 644	11,500 39,500		9.35 8.59	500	
	All Stream	3,815	12,768	2,956,118		3.35	775	
	All Types Open Reproduction	67,913 4,806	53,937 1,043	11,480,025 366,010		.79	169 76	
	Dense Reproduction	102	3			.03		
Sevenec	All Uplend Stream (Hand)	4,908 1,088	1,046 1,710	366,010 372,268		1.57	75 342	
Nursery	Stream (Chemicel)	239	777	188,401	32,132	3.25	788	134
	Stream (Slash)	1,088	168 2,655	22,500 583,169		3,73 2.44	500 536	
	All Types	5,996	3,701	949,179		.62	158	
	Open Reproduction Dense Reproduction	40,136	33,483	6,387,933 223,472		.83	159 48	
	Open Pole	36,182	15,003	2,281,734		.41	63	
	Dense Pols Open Meture	6,284	1,132 7,440	224,434 1,489,101		.18	36 90	
	Dense Meturs	9,165	546	57,146		.06	6	
All	Brush Burn	3,716 115	2,138	591,639		.58	159	
Forests	Meedow-Field All Uplend	451 117,274	151 61,691 20,616	12,131		.33	27 96	-
	Stream (Hand)	7,855		11,267,622		2.62	562	
	Streem (Chemical) Stream (Slesh)	704 68	1,957 383	265,480	57,825	2.78	377 500	82
	Stream (Machine)	75	644	34,000 39,500		8,59	527	
	All Stream All Types	7,953	23,600 85,291	4,753,446		2.97	598 128	
	Open Reproduction	261	201				0.0	
	Dense Reproduction	80	164	25,455 67		.63	98	
Kootensi	Dense Reproduction	80 779	607	40,490		.01	1 52	
Kootensi	Dense Reproduction Open Pole All Uplend Stream (Hand)	80 779 1,120 533	1 607 772 805	67 40,490 66,012 62,875		.01 .78 .69	1 52 59 118	
Kootensi	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types	80 779 1,120 533 1,653	1 607 772 805 1,577	67 40,490 66,012 62,875 128,887		.01 .78 .69 1.51	1 52 59 118 78	
Kootensi	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole	80 779 1,120 533 1,653 4,026 438	1 607 772 805 1,577 5,500	67 40,490 66,012 62,875 128,887 606,664		.01 .78 .69 1.51 .95 1.37	1 52 59 118 78 151 76	
Kootensi	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Pole Lense Pole	80 779 1,120 533 1,653 4,026 438 153	1 607 772 805 1,577 5,500 333 61	67 40,490 65,012 62,875 128,887 606,664 33,208 2,794		.01 .78 .69 1.51 .95 1.37 .76 .40	1 52 59 118 78 151 76 18	
	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Pole Lense Pole	80 779 1,120 533 1,653 4,026 438 153	1 607 772 805 1,577 5,500 333 61 15 5,909	67 40,490 65,012 62,875 128,887 606,664 33,208 2,794		.01 .78 .69 1.51 .95 1.37 .76 .40	1 52 59 118 78 151 76 18 121	
	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand)	80 779 1,120 533 1,653 4,026 438 153 12 4,629 920 111	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266	67 40,490 66,012 62,875 128,887 606,664 33,208 2,794 1,456 644,122 137,507	6,416	.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.28	1 52 59 118 78 151 76 18 121 139 149 173	58
Kootensi	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Chemicel)	80 779 1,120 533 1,653 4,026 438 153 12 4,629 920 111 920	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266 1,937	67 40,490 66,012 62,875 128,887 606,664 33,208 2,794 1,456 644,122 137,507 19,248 156,755	6,416	.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.28	1 52 59 118 78 151 76 18 121 139 149 173	58
	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Ohenicel) All Stream All Types Open Reproduction Open Reproduction Open Reproduction	80 779 1,120 533 1,653 4,026 438 153 12 4,629 920 111 920 5,549 164	1 607 772 805 1,577 5,500 61 15 5,909 1,671 266 1,937 7,846	67 40,490 66,012 62,875 128,887 606,664 33,208 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,036	6,416	.01 .78 .69 1.51 .95 1.37 .76 .40 1.28 1.82 2.40 2.11 1.41	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208	58
Cabinet	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream Stream (Stream (Stream (Stream (Stream (Stream Stream Stream Stream Stream Stream Stream Stream (Stream Stream Stream (Stream (Stream Stream Stream (Hand)	80 779 1,120 533 1,653 4,026 438 153 12 4,629 920 111 920 5,549 164	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266 1,937 7,846 181	67 40,490 65,012 62,875 128,887 606,664 33,208 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,036 294,320		.01 .78 .63 1.51 .95 1.37 .76 .40 1.25 1.82 2.40 2.11 1.11 1.10	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 306	
Cabinet Sevenac	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Ghemicel) All Stream (Ghemicel) All Types Open Reproduction Stream (Ghemicel) All Stream (Chemicel) Stream (Ghemicel)	80 779 1,120 533 1,653 4,026 4,026 1,53 12 4,629 920 111 920 5,549 1,644 962 62	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266 1,937 7,846 181 1,009 103	67, 40,490 65,012 62,875 128,887 606,664 3,208 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,036 294,320 12,400	6,416	.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.28 2.40 2.11 1.10 1.05 1.66 2.40	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 306 200 200	58
Cabinet Sevenac	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Hend) Stream (Hend) Stream (Hend) Stream (Hend) Stream (Hand) Stream (Mechine) All Stream	80 779 1,120 533 1,653 4,026 4,026 153 12 4,629 920 111 920 5,549 164 962 62 15	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266 1937 7,846 181 1,009 103 36	67, 40,490 66,012 62,875 128,887 606,664 33,208 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,036 294,320 12,400 3,000		.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.28 2.40 2.11 1.10 1.05 1.66 2.40 1.18	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 306 200 200 317	
Cabinet Sevenac	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Hand) All Stream All Types Open Reproduction Stream (Hend) Stream (Hend) Stream (Hend) Stream (Menicel) All Stream All Typee Open Reproduction Stream (Menicel) Stream (Menicel) Stream (Menicel) Open Reproduction Open Reproduction	80 779 1,120 533 1,653 4,026 4,38 153 12 4,629 920 5,549 111 164 962 62 62 1,114 1,141 4,451	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266 1,937 7,846 111 11,009 103 36 1,148 1,329 5,849	67, 40,490 65,012 62,875 128,887 606,664 2,794 1,456 644,122 137,507 19,248 155,755 800,877 34,036 294,320 12,400 3,000 309,720 343,756 666,155		.01 .78 .69 1.51 .95 1.37 .76 .40 1.28 1.82 2.40 2.11 1.10 1.05 1.66 2.40 1.18 1.16 1.16	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 306 200 200 317	
Cabinet Sevenac	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Hend) Stream (Hend) Stream (Hend) Stream (Hend) Stream (Hend) Stream (Hend) All Stream All Types Open Reproduction Stream (Mechine) All Stream (Mechine)	80 779 1,120 533 1,653 4,026 438 153 12 4,629 920 1,11 111 112 920 6,549 164 962 62 15 977 1,141 4,451	1 607 772 805 1,577 5,500 333 61 15 5,909 1,671 266 1,337 7,846 11 100 3,66 1,148 1,329 5,845 5,845 5,845 5,845	67, 49, 490, 65, 012, 62, 875, 666, 155, 664, 664, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67		.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.82 2.40 2.11 1.10 1.05 1.66 2.40 1.18 1.16 1.16	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 306 200 200 200 317 301	
Cabinet Sevenac	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Hand) Stream (Hend) Dense Reproduction Dense Reproduction Open Pole Dense Pole	80 779 1,120 533 4,026 438 153 12 4,623 920 5,549 164 962 62 62 15 977 1,141 4,451 80 1,217	1 607 772 805 1,597 5,500 333 61 1,671 266 1,937 7,846 181 1,009 103 36 1,144 1,329 5,845 1,329 5,845	67 40,490 65,012 62,875 128,887 606,664 33,208 2,794 1,456 644,122 137,507 34,036 294,320 12,400 30,030 30,720 343,756 66,155 67 73,698 67 73,698 2,794		.01 .78 .65 1.51 .95 1.37 .76 .40 1.25 1.82 2.40 2.11 1.41 1.10 1.05 1.66 2.40 1.18 1.16 1.31 .01 .77 .40	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 200 200 317 301 150 1 16 1	
Cabinet Sevenac Nursery	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Chemical) All Types Open Reproduction Stream (Mechine) All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Open Meture All Uplend	80 779 1,120 533 4,026 438 4,026 4,029 153 12 4,623 920 5,549 164 62 62 62 62 15 977 1,141 4,451 80 1,217 153 153 12 5,5913	1 607 772 805 1,577 5,500 333 61 15 5,909 1,67 266 1,937 7,846 11 100 35 1,149 103 1,329 5,845 1,149 1,329 5,845 61 1,540 1,55 1,577	67, 40, 490 62, 876, 512, 62, 876, 666, 664, 684, 122, 137, 507, 684, 122, 137, 507, 34, 036, 294, 320, 234, 756, 666, 157, 698, 2, 794, 1, 456, 667, 73, 698, 2, 794, 1, 456, 674, 1, 476, 674, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,		.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.82 2.40 2.11 1.41 1.10 1.05 1.18 1.18 1.18 1.18 1.18 1.18 1.18 1.1	1 52 59 118 78 151 76 18 121 139 149 173 170 144 208 306 200 317 301 150 150 161 18	
Cabinet Sevenac Nursery	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Jole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Ghemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) Stream (Chemicel) Ense Reproduction Dense Reproduction Dense Reproduction Open Pole Dense Pole Open Meture All Upland	80 779 1,120 533 4,026 4,026 1,653 12 4,623 920 5,549 111 164 962 62 15 17 1,141 4,451 1,217 1,217 1,217 1,217	1 607 778 805 1,577 5,500 333 61 15 5,909 1,671 1,671 1,009 103 36 1,1329 5,845 1,1329 5,845 1,1329 5,845 1,529 5,845 1,529 5,845 1,548 1,	67, 40, 490, 65, 012, 62, 375, 61, 62, 475, 475, 475, 475, 475, 475, 475, 475	4,130	.01 .733 1.51 .95 1.37 .76 .40 1.25 1.82 2.40 1.05 1.16 2.40 1.16 1.16 1.16 1.16 1.16 1.16 1.16 1.1	1 52 78 118 151 176 18 121 173 173 149 173 208 306 306 307 307 150 150 150 150 161 181 181 181 191 193 193 193 193 193 193 193 193 19	67
Cabinet Sevenac Nursery	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Zole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Ghemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Open Dele Dense Pole Dense Pole Dense Pole Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand)	80 779 1,120 533 1,653 4,026 4,038 153 12 4,623 920 5,549 111 164 962 62 15 17 1,141 4,451 1,217	1 607 772 805 1,577 5,500 333 61 15 5,909 7,646 101 1,009 103 26 6,1,48 1,329 5,845 1,329 5,845 6,862 3,485 3,693	67, 49, 490, 65, 012, 62, 375, 5128, 387, 606, 664, 122, 137, 507, 134, 036, 294, 320, 399, 720, 343, 756, 666, 155, 735, 698, 1456, 744, 170, 7494, 702, 31, 648, 3,000		.01 .78 .69 1.51 .95 1.37 .76 .40 1.25 1.82 2.41 2.11 1.10 1.05 1.66 2.40 1.18 1.16 1.31 .01 .77 .40	118 76 118 151 151 151 151 151 151 151 151 151	
Cabinet Sevenac Nursery	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Zole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Ghemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Open Dele Dense Pole Dense Pole Dense Pole Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand)	80 779 1,120 533 1,653 4,026 4,388 153 122 4,623 920 111 920 62 62 62 62 62 1,141 4,451 80 1,217	1 607 772 805 5,500 333 61 15 5,909 1,671 266 1,337 7,846 61,149 1,009 1,003 3,66 1,149 1,329 5,845 5,	67, 49, 490 65, 012 62, 876, 128, 887, 606, 664, 33, 208, 2, 794, 1, 456, 644, 122, 137, 507, 34, 036, 294, 320, 234, 756, 677, 2, 688, 2, 794, 248, 752, 677, 2, 698, 2, 794, 1, 456, 744, 170, 494, 702, 31, 648, 3, 000, 529, 350, 720, 341, 756, 773, 698, 2, 794, 744, 770, 73, 648, 744, 770, 748, 748, 752, 754, 754, 754, 754, 754, 754, 754, 754	4,130	.01 .78 .69 1.51 .95 .76 .40 .0 1.25 1.28 1.22 2.40 2.11 1.41 1.10 1.65 1.66 2.40 1.18 1.18 1.16 1.31 .01 .77 .40 1.25 1.25 1.28 1.26 1.26 1.26 1.26 1.27 1.27 1.27 1.28 1.28 1.29 1.29 1.29 1.29 1.29 1.29 1.29 1.29	1 52 59 118 76 18 19 19 19 19 19 19 19 19 19 19 19 19 19	67
Cabinet Sevenac Nursery	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Chemics) All Stream All Types Open Reproduction Stream (Chemics) All Stream All Types Open Reproduction Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) All Stream (Mechine) Dense Reproduction Dense Reproduction Dense Reproduction Stream (Mechine) Stream (Mechine) Stream (Mechine) Stream (Mechine)	80 779 1,120 1,120 4,026 4,383 153 12 4,523 1,11 1,20 1,11 1,20 1,11 1,20 1,54 1,54 1,14 1,45 1,20 1,20 1,20 1,20 1,20 1,20 1,20 1,20	1 607 772 805 1,577 5,500 333 61 15 5,909 7,646 101 1,009 103 26 6,1,48 1,329 5,845 1,329 5,845 6,862 3,485 3,693	67, 49, 490, 65, 912, 66, 912, 62, 975, 66, 664, 122, 137, 507, 134, 936, 937, 938, 938, 938, 938, 938, 938, 938, 938	4,130	.01 .783 .699 1.51 .955 .400 .125 .128 .22.400 .11 1.05 .106 .107 .108 .108 .108 .108 .108 .108 .108 .108	118	67
Cabinet Sevenac Nursery	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Chemicel) All Stream All Types Open Reproduction Stream (Genicel) All Stream All Types Open Reproduction Stream (Chemicel) Stream (Chemicel) Stream (All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream	80 779 1,120 533 1,653 4,026 4,388 153 122 4,623 920 111 920 62 62 62 62 62 155 977 1,141 4,451 153 2,430 8,343 7ABLE	1 607 778 6550 1,577 5,500 333 61 15 5,939 1,671 266 1,337 7,846 161 1,009 1,003 66 1,148 1,329 5,845 5,845 5,845 366 3,890 10,752 70 - THIR	67, 49, 490 65, 012 62, 875, 128, 887, 606, 664, 128, 887, 148, 148, 128, 137, 1507, 137, 1507, 137, 137, 137, 137, 137, 137, 137, 13	4,130	.01 .78 .69 1.51 1.37 .76 .40 1.25 1.82 2.40 2.11 1.41 1.10 1.05 2.40 1.13 1.41 1.15 1.16 2.40 1.16 1.25 1.16 2.40 1.16 1.16 1.16 1.16 1.16 1.16 1.16 1.1	1 52 59 118 78 151 18 121 121 127 144 149 149 149 140 200 200 200 301 150 161 181 181 181 181 181 181 181 181 181	67
Cabinet Sevenac Nursery All Forests	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Chemics) All Stream All Types Open Reproduction Stream (Chemics) All Stream All Types Open Reproduction Stream (Mechine) All Stream All Types Open Reproduction Stream (Genics) Stream (Mechine) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Stream (Chemics) Stream (Chemics) Stream (Chemics) All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream Chemics) Open Reproduction Cpen Pole Dense Pole	80 779 1,120 1,120 1,653 4,026 4,388 153 12 4,523 920 111 920 164 962 62 62 62 15 977 1,141 4,451 173 12 1,217 173 1,217 173 1,217 173 1,217 1,2	1 607 778 6550 1,577 5,500 333 61 15 5,939 1,671 266 1,337 7,846 161 1,009 1,003 66 1,148 940 61 15 5,845 369 36 6,862 3,485 369 36 6,862 70 - THIR	67, 40, 490 65, 012 62, 875, 128, 887, 606, 664, 128, 148, 148, 148, 148, 148, 148, 148, 14	4,130	.01 .78 .69 .69 1.51 1.37 .76 .40 .40 .1.25 1.82 2.40 2.11 1.41 1.41 1.66 2.40 1.25 1.16 2.40 1.25 1.16 2.40 2.11 1.41 1.41 1.41 1.41 1.41 1.41 1.41	1 52 59 78 118 151 121 129 149 149 149 120 120 120 120 120 120 120 120 120 120	67
Cabinet Sevenac Nursery All Forests	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Chemics) All Stream All Types Open Reproduction Stream (Chemics) All Stream All Types Open Reproduction Stream (Mechine) All Stream All Types Open Reproduction Stream (Genics) Stream (Mechine) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Stream (Chemics) Stream (Chemics) Stream (Chemics) All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream Chemics) Open Reproduction Cpen Pole Dense Pole	80 779 1,120 5,33 1,653 4,026 4,38 153 12 4,629 111 920 0 5,549 164 62 62 62 155 977 1,141 4,451 80 1,217 1,	1 607 772 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	67, 40, 490 65, 012 62, 875, 128, 887, 606, 664, 128, 148, 148, 148, 148, 148, 148, 148, 14	4,130	.01 .78 .69 .78 .95 1.37 .78 .1.25 1.82 2.11 1.10 1.05 1.66 2.40 2.11 1.10 1.25 1.32 2.10 1.05 2.40 1.05 2.40 1.05 2.40 1.05 2.40 1.05 2.40 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.0	1 1 2 59 118 121 121 121 121 121 121 121 121 121	67
Cabinet Sevenac Nursery All Forests	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Chemics) All Stream All Types Open Reproduction Stream (Chemics) All Stream All Types Open Reproduction Stream (Mechine) All Stream All Types Open Reproduction Stream (Genics) Stream (Mechine) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Stream (Chemics) Stream (Chemics) Stream (Chemics) All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream Chemics) Open Reproduction Cpen Pole Dense Pole	80 779 1,120 5,533 1,653 4,026 4,389 153 124 4,623 111 920 0 111 920 62 62 62 155 977 1,141 4,451 80 1,217 1	1 607 772 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	67 40,490 65,012 62,975 606,664 33,206 2,794 1,456 644,122 137,507 19,248 156,755 600,877 34,036 294,320 12,400 309,720 309,720 343,756 666,155 67 73,698 2,794 1,456 41,700 494,702 31,648 3,000 529,350 0 WORKINC 54,129 55,606 60 50 59,995 5,214	4,130	.01 .78 .69 .78 .95 1.37 .78 .40 .1.25 1.82 2.40 2.11 1.10 1.05 1.62 2.40 1.10 1.01 1.01 1.01 1.01 1.01 1.01 1	1	67
Cabinet Sevenac Nursery All Forests	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Hand) Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Pole Open Meture All Upland Stream (Chemicel) Stream (Chemicel) Stream (Chemicel) Stream (Mand) Stream (Chemicel) Stream (Chemicel) Stream (Chemicel) All Types  Open Reproduction Open Pole Dense Pole All Upland Stream (Hand) Stream (Hand) Stream (Chemicel) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Chemicel) Stream (Chemicel) Stream (Chemicel)	800 779 1,120 779 1,120	1 607 778 6550 1,579 5,500 1,579 61 1,579 7,846 1,132 9 1,671 1,000 1,148 1,500 1,752 1,75	67, 40,490 65,012 62,975 128,887 606,664 23,208 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,036 294,320 12,400 30,702 31,000 30,720 343,756 666,155 6744,170 494,702 31,648 3,000 529,350 1,273,520 D WORKINC	4,130	.01 .78 .69 .78 .95 1.37 .78 .40 .1.25 1.82 2.40 2.11 1.10 1.05 1.62 2.40 1.10 1.01 1.01 1.01 1.01 1.01 1.01 1	1	67
Cabinet Sevenac Nursery All Forests	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Hand) Stream (Chemics) All Stream All Types Open Reproduction Stream (Chemics) All Stream All Types Open Reproduction Stream (Mechine) All Stream All Types Open Reproduction Stream (Genics) Stream (Mechine) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Stream (Chemics) Stream (Chemics) Stream (Chemics) All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream Chemics) Open Reproduction Cpen Pole Dense Pole	80 779 1,120 5,533 1,653 4,026 4,389 153 124 4,623 111 920 0 111 920 62 62 62 155 977 1,141 4,451 80 1,217 1	1 607 772 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	67, 40,490 65,012 62,375 128,887 606,664 23,208 2,794 1,456 644,122 137,007 19,248 156,755,800,877 34,036 624,320 12,400 39,720 340,756 666,155 73,698 2,794 1,456 744,170 231,648 3,000 529,350 0 WORKINC 54,129 0 WORKINC 54,129 55,806 59,955 5,214 10,635 5,214 10,635	4,130	.01 .78 .69 .51 .37 .40 .60 .1.25 .1.28 .1.25 .1.28 .1.25 .1.22 .2.40 .2.11 .1.05 .1.62 .2.40 .1.10 .1.62 .1.21 .1.62 .1.25 .1	1 1 5 5 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5 5 1 2 5	67
Cabinet Savenac Nursery All Forests Cabinet	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream Chemicel) Stream (Chemicel) Stream (Chemicel) Stream (Hand) Stream (Hand) Stream (Particular (Chemicel) All Types Open Reproduction Dense Reproduction Open Pole Dense Pole Open Meture All Upland Stream (Chemicel) Stream (Mechine) All Stream All Types Open Reproduction Open Pole Dense Pole All Upland Stream (Chemicel) Stream (Mechine) All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Stream All Types	80 779 1,120 1,120 1,153 1,653 4,026 4,389 920 111 920 164 962 62 62 62 15 977 1,141 4,451 173 183 1,217 173 183 183 183 183 183 183 183 183 183 18	1 607 778 650 1,577 5,500 1,577 5,500 1,577 5,500 1,577 5,500 1,577 1,676 1,181 1,009 1,003 1,148 1,329 5,845 1,584 1,59 36 1,584 1,58 369 36 1,752 70 - THIR 470 95 4,584 1,58 4,58 5,890 10,752 70 - THIR 470 95 4,58 1,58 1,58 1,58 1,58 1,58 1,58 1,58 1	67, 49, 490 65, 012 62, 875, 128, 887, 606, 664, 129, 137, 507, 139, 248, 320, 320, 320, 320, 320, 320, 320, 320	4,130	.01 .78 .69 .1.51 .95 1.37 .76 .40 .1.25 1.28 1.18 1.10 2.11 1.10 1.05 1.66 2.11 1.10 1.25 1.25 1.28 1.10 2.11 1.10 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	1 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	67
Cabinet Savenac Nursery All Forests Cabinet	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Stream (Hand) Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream All Types Open Reproduction Stream (Chemicel) All Stream Chemicel) Stream (Chemicel) Stream (Chemicel) Stream (Mechine) All Stream All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Reproduction Stream (Mechine) All Stream All Types Open Meture All Upland Stream (Chemicel) Stream (Mechine) All Stream All Types Open Reproduction Open Pole Dense Pole All Upland Stream (Chemicel) Stream (Mechine) All Stream All Stream All Types Open Reproduction Stream (Stream (Stream (Chemicel) Stream (Chemicel) All Stream Stream (Chemicel) All Stream Stream (Stash) All Stream (Stash) Stream (Stash) Stream (Stash)	80 779 1,120 779 1,120 1	1 607 778 6550 1,579 5,500 155 6,959 100 61 155 61	67, 40, 490 65, 012 62, 875, 128, 887, 606, 664, 129, 129, 129, 129, 129, 129, 129, 129	4,130	.01 .78 .69 .59 .37 .76 .40 .125 .1.28 .1.28 .1.22 .1.23 .1.24 .1.29 .1.25 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.23 .1.24 .1.25 .1.	1 1 2 5 5 5 2 5 5 5 5 5 5 5 5 5 5 5 5 5	67
Cabinet Savenac Nursery All Forests Cabinet	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Ghemics) Stream (Ghemics) All Stream All Types Open Reproduction Stream (Chemics) All Stream All Types Open Reproduction Stream (Chemics) Stream (Chemics) Stream (Chemics) Stream (Chemics) Stream (Chemics) Stream (Hand) Stream (Chemics) Stream (Hand) Stream (Chemics) Stream (Mechine) All Types Open Reproduction Open Pole Dense Reproduction Open Meture All Upland Stream (Chemics) Stream (Mechine) All Stream All Types Open Reproduction Copen Pole Dense Pole Open Meture All Upland Stream (Chemics) Stream (Chemics) Stream (Chemics) Stream (Chemics) Stream (Ghemics) Stream (Ghemics) Stream (Ghemics) Stream (Shab) All Stream All Types Stream (Slash) All Stream	80 779 1,120 779 1,120 779 1,120 533 1,653 4,026 4,388 153 12 4,629 111 920 111 920 62 62 62 62 155 977 1,141 4,451 60 1,217 5,913 2,415 173 153 38 343 TABLE 12 72 72 72 72 1,616 40 0 1,616 1,616	1 607 772 6 607 772 6 607 772 6 607 772 6 607 607 607 6 607	67, 49, 490 65, 012, 66, 615, 616, 664, 129, 62, 137, 600, 677, 19, 244, 190, 666, 155	4,130	.01 .78 .69 .1.51 .37 .76 .40 .0 .1.25 .1.28 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.26 .1.27 .1.27 .1.28 .1.28 .1.29 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.20 .1.	1 1 2 5 5 2 5 5 5 5 5 7 7 2 5 5 5 5 5 5 5 5	67
Cabinet Savenac Nursery All Forests Cabinet	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Chemical) All Stream All Types Open Reproduction Open Reproduction Stream (Chemical) All Stream (Ind) Stream (Chemical) All Stream All Types Open Reproduction Stream (Chemical) All Stream Chemical Stream (Hand) Stream (Hand) Stream (Hand) Stream (Chemical) Stream (Hand) Stream (Chemical) Stream All Types Open Reproduction Open Fole Dense Reproduction Stream (Hand) Stream All Types Open Meture All Stream All Types Open Reproduction Chemical) Stream (Chemical) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Slash) All Stream All Types Open Reproduction Open Pole	80 779 1,120 779 1,120 779 1,120 1,653 1,654 1,6	1	67 40,490 65,012 62,875 126,887 606,664 33,206 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,356 294,320 12,400 399,720 343,756 666,155 67 73,698 2,794 1,456 494,702 31,648 3,000 529,350 0 WORKINC 54,129 5,666 55,214 1,676 56,97 51,684 1,276 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,847 1,079 51,848 1,079 51,848 1,079 51,848	4,130	.01 .78 .69 .59 .1.37 .76 .40 .95 .1.25 .1.28 .2.40 .1.82 .2.40 .1.10 .1.05 .1.62 .1.11 .1.05 .1.62 .1.11 .1.05 .1.62 .1.11 .1.05 .1.62 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1.11 .1.05 .1.12 .1	1 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	67
Sevenac Nursery  All Forests  Cabinet	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Pole Lense Pole Open Meture All Uplend Streem (Hand) Streem (Hand) Streem (Hand) Streem (Chemicel) All Streem All Types Open Reproduction Stream (Chemicel) All Streem All Types Open Reproduction Stream (Chemicel) All Streem All Types Open Reproduction Dense Reproduction Dense Reproduction Dense Pole Open Meture All Uplend Streem (Chemicel) All Streem All Types Open Reproduction Stream (Mechine) All Streem (Chemicel) Stream (Mechine) All Streem (Chemicel) Stream (Mechine) All Streem All Types Open Reproduction Open Pole Dense Pole All Uplend Streem (Hand) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) All Streem All Types Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction	80 779 1,120 779 1,120 1	1 607 778 642 2,1000 2,135 5,55 95 4 4 778 778 778 778 778 778 778 778 778	67, 40, 490 65, 012 62, 875, 128, 887, 606, 664, 129, 129, 129, 129, 129, 129, 129, 129	4,130	.01 .78 .69 .78 .77 .76 .40 .77 .77 .77 .77 .77 .77 .77 .77 .77 .7	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	67
Cabinet  Savenac Nursery  All Forests  Cabinet  Savanec Nursery	Dense Reproduction Open Pole All Uplend Streem (Hand) All Types Open Reproduction Open Jole Lense Pole Open Meture All Uplend Streem (Hand) Streem (Ghemicel) All Types Open Reproduction Stream (Chemicel) All Streem All Types Open Reproduction Stream (Chemicel) All Streem All Types Open Reproduction Open Pole Dense Reproduction Open Pole Dense Reproduction Open Pole Dense Reproduction Streem (Chemicel) All Types Open Reproduction Open Pole Dense Pole All Types Open Reproduction Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Chemicel) Streem (Hand) Streem (Hand) Streem (Hand) Streem (Hand) Streem (All Types Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Reproduction Open Pole Dense Pole All Uplend Streem (Hand) Streem (Hand)	80 779 1,120 779 1,120 1,533 1,653 4,026 4,388 153 12 4,623 111 920 5,549 164 962 62 15 977 1,141 4,451 164 4,451 173 183 182 184 185 195 195 195 195 195 195 195 195 195 19	1 607 778 6 607 778 6 607 778 6 607 778 6 607 6	67, 40,490 65,012 62,375 128,887 606,664 23,208 2,794 1,456 644,122 137,007 19,248 156,755 800,877 34,036 294,320 12,400 39,720 34,076 666,155 677 73,698 2,794 1,456 744,170 494,702 31,648 3,000 52,735 50,737 50,	10,546	.01 .78 .69 .51 .37 .40 .95 .1.25 .1.25 .1.25 .1.25 .1.25 .1.22 .2.40 .2.11 .1.05 .1.26 .1.25 .1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	61
Sevenac Nursery  All Forests  Cabinet	Dense Reproduction Open Pole All Uplend Stream (Hand) All Types Open Reproduction Open Pole Dense Pole Open Meture All Uplend Stream (Chemical) All Stream All Types Open Reproduction Open Reproduction Stream (Chemical) All Stream (Ind) Stream (Chemical) All Stream All Types Open Reproduction Stream (Chemical) All Stream Chemical) Stream (Chemical) Stream (Hand) Stream (Hand) Stream (Hand) Stream (Chemical) Stream All Types Open Reproduction Dense Reproduction Open Fole Dense Pole Open Meture All Upland Stream (Hand) Stream (Slash) All Stream All Types Open Reproduction Open Pole Dense Pole Dense Pole Dense Pole All Uplend	80 779 1,120 779 1,120 779 1,120 1,653 1,654 1,656 1,6	1	67 40,490 65,012 62,875 126,887 606,664 33,206 2,794 1,456 644,122 137,507 19,248 156,755 800,877 34,356 294,320 12,400 309,720 343,756 666,155 67 73,698 2,794 1,456 494,702 31,648 3,000 529,350 0 WORKINC 54,129 5,636 60 50,995 5,214 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,844 1,079 5,846 60 60 60 60 60 60 60 60 60	10,546 3,545	.01 .78 .69 .1.51 .37 .76 .40 .0 .1.25 .1.28 .1.26 .1.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	67



TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1928-1941
MONTANA OPERATION

			·									
							Per Acre Bae					
			Effective	Totel	Gallons	Man-		Gellone Per				
Working	Cleee	Acres	Men-Deys	Ribee	Sprey	Deys	Ribee	Spreyed Ares				
	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334	148				
	FS-Reg.	12,524		1,653,529		.91	132	54				
	EQ-NIRA	21,773	8,027	2,158,067		.37	99					
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40				
First	EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78	44				
	FS-ERA	11,247	16,299	2,473,391	10,181	1.45	220	90				
	F-CCC	13,772	10,083	1,296,868	2,780	.73	94	59				
	Totel	125,227	85,291	16,021,068	57,825	.68	128	82				
	EQ-Reg.	619	980	299,410	4,130	1.58	484	67				
	FS-Reg.	3,604	3,537	341,025	5,376	.98	95	59				
Second	EQ-ERA	1,342	1,597	265,637		1.19	198					
Second	FS-ERA	2,100	2,464	204,021	1,040	1.17	97	52				
	F-CCC	678	2,174	163,427		3,21	241					
	Totel	8,343	10,752	1,273,520	10,546	1.29	153	61				
	FS-Reg.	1,334	1,864	78,437		1.40	59					
	EQ-ERA	648	777	59,040		1.20	91					
Third	FS-ERA	150	68	6,069		.45	40					
	F-CCC	25	183	11,714	3,545	7.32	469	295				
	Total	2,157	2,892	155,260	3,545	1.34	72	295				
	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380	129				
	FS-Reg.	17,462	16,793	2,072,991	7,828	.96	119	58				
	EQ-NIRA	21,773	8,027	2,158,067		.37	99					
All	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40				
Workings	EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82	44				
	FS-ERA	13,497	18,831	2,683,481	11,221	1.40	199	84				
	F-CCC	14,475	12,440	1,472,009	6,325	.86	102	107				
	Totel	135,727	98,935	17,449,848	71,916	.73	129	81				

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1928-1941
MONTANA OPERATION

Forest	Working		es Worked by Own Clesses Stets - Montans	•	Totel
	First	46,781		4,537	51,318
Kootenei	Second	1,165		488	1,653
	Totel	47,946		5,025	52,971
	First	56,615	696	16,598	73,909
	Second	5,211		1,479	6,690
Cebinet	Third	897		1,260	2,157
	Totel	62,723	696	19,337	82,756
	First	103,396	696	21,135	125,227
All	Second	6,376		1,967	8,343
Forests	Third	897		1,260	2,157
	Totel	110,669	696	24,362	135,727

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1928-1941
MONTANA OPERATION

Forest	Ownerehip Cless		nber of Ad		Acree Meture Stands on Which Working Is Deferred	Totel Acres White Pine
	Forest Service	46,781	28,720	75,501	11,394	86,895
Kootenei	Stets - Montane		234	234		234
FOOTEHEL	Privete	4,537	5,749	10,286	2,490	12,776
	Totel	51,318	34,703	86,021	13,884	99,905
	Forsst Service	56,615	17,703	74,318	2,312	76,630
Cebinst	Stete - Montane	696		696		696
Cepiner	Privete	16,598	6,911	23,509		23,509
	Totel	73,909	24,614	98,523	2,312	100,835
	Foreet Service	103,396	46,423	149,819	13,706	163,525
All	Stete - Montane	696	234	930		930
Foreste	Privete	21,135	12,660	33,795	2,490	36,285
	Totel	125,227	59,317	184,544	16,196	200,740

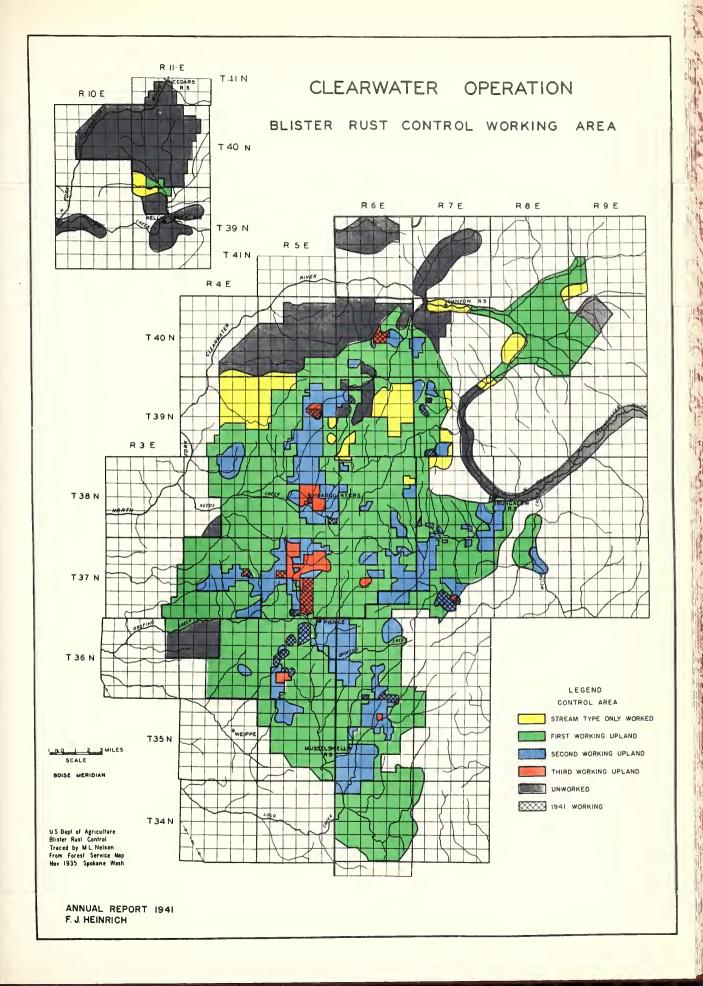


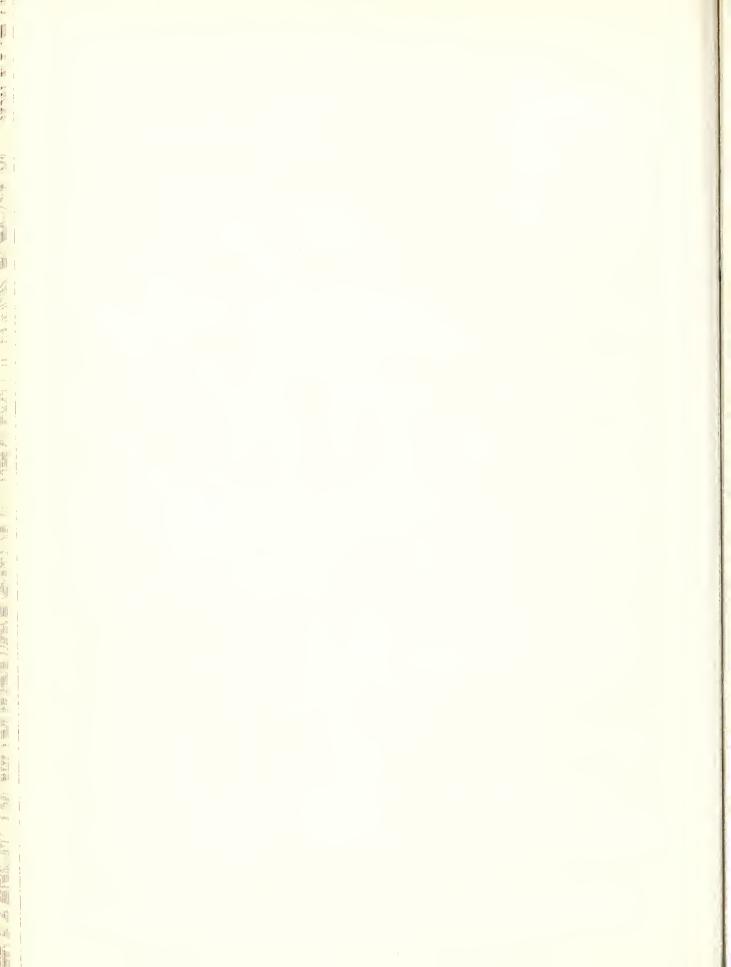
TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1928-1941 MONTANA OPERATION

	Ribes Total triste Ribes		1,145 6,387,933	223,472	2,281,734	224,434	1,489,101	57,146	591,639	32	12,131	1,145 11,267,622	21,123 4,753,446	22,268 16,021,068	2,591 666,155	49	73,698	2,794	1,456	2,591 744,170	564	9,155 1,273,520	55,208	5,806	09	61,074	7,090 94,186	7,090 155,260	3,736 7,109,296	223,539	2,361,238	227,288	1,490,557	57,146	591,639	32	12,131	3,736 12,072,866	34 777 5 376 989
	Ribes coloradense to	╬	+	2,279			690,7	188				10,712	31,905 2	H															1,176	2,279			7,069	188				10,712	אן פטפ וא
	Ribes irriguum (	7 10 10 10 10 10 10 10 10 10 10 10 10 10	PC/, CTT	1,048	75,929	8,409	8,729		5,162			213,031	5,744	218,775	10,666		921			11,587	10,975	22,562	200	9		206		206	124,620	1,048	76,856	8,409	8,729		5,162			224,824	16 719
by Species	Ribes inerme		890,00		93,026	8,179	11,080		5,260		7,121	180,235	1,284,254	1,464,489	4,668		6,134	282		11,087	324,083	335,170					61,635	61,635	60,237		091,66	8,464	11,080		5,260		7.121	191,322	1 669 979
Ribes	Ribes petiolare		4,714		200		528					5,173	266,006	+	4,860					4,860	41,728	46,588					17,574	17,574	9,574		200		259					10,033	495 40R
	Ribes viscosissimum		3,252,748	73,843	864,605	77,785	172,589	4,807	294,808			4,751,185	118,098	4,869,283	275,909	4	22,576	1,708		300,197	3,123	303,320	24,236	2,000	09	29,296	20	29,316	3,562,893	73,847	892,181	79,553	172,589	4,807	294,808			5,080,678	191 941
	Ribes lacustre		2,948,827	146,302	1,247,974	130,061	1,289,375	52,151	286,409	32	5,010	6,106,141	3,026,316	9,132,457	367,461	63	44,067	801	1,456	413,848	142,877	556,725	30,772	800		31,572	7,867	39,439	3,347,060	146,365	1,292,841	130,862	1,290,831	52,151	286,409	32	5.010	6,551,561	5 177 060
	Acres		$\rightarrow$	4,666	36,182	6,284	16,559	9,165	3,716	115	451	117,274	7,953			90	1,217	153	12	5,913	2,430	8,343	419	38	12	469	1,688	2,157	45,006	4,746	37,437	6,449	16,571	9,165	3,716	115	451	1	
	Eradication Type		Open Reproduction	Dense Reproduction	Open Pole	Dense Pole	Open Mature	Dense Mature	Brush	Burn	Meadow-Field	All Upland		pes	oduction	Dense Reproduction	Open Pole	Dense Pole	Open Mature	All Upland	Stream	All Types	Open Reproduction	Open Pole	Dense Pole	All Upland	Stream	All Types	Open Reproduction	Dense Reproduction	Open Pole	Dense Pole	Open Mature	Dense Mature	Brush	Burn	Meadow-Field	All Upland	Stream
	Working							1	rirst			.,							Second		11.	11				Third				-				All	Workings				







BLISTER RUST CONTROL WORK, CLEARWATER OPERATION, 1941 By

F. J. Heinrich, Associate Pathologist
David Kyle, Assistant Forester, U. S. Forest Service
H. J. Faulkner, Chief Scientific Aid

# INTRODUCTION

On the Clearwater operation the blister rust situation remains serious. This is especially true with respect to the stands of young white pine, the acreage of which has been increased rapidly in the last few years by an accelerated logging schedule which is now being greatly expanded to meet national defense needs. Coincident with this steady increase in cutting there has been an equally steady decrease in the amount of control work performed due to inadequate project facilities. This is brought sharply into focus by comparison of the acreages worked in each of the 13 years of operation which shows the 1941 results of 8,601 acres to be third lowest, the two smaller amounts coming from the first two years of work in the program, 1929 and 1930. Further evidence is found in figures for the past four years when the production of worked acres has decreased annually from 38,696 to 8,601.

The accomplishments of 1941 were wholly satisfactory in light of the many difficulties that arose even though some of the areas scheduled for working could not be completed. The two factors which made impossible the completion of scheduled areas, which were also factors affecting the total accomplishments for the year, were the drastic reductions in available CCC and WPA workers and the occurrence of rain throughout most of the season.

The shortage of CCC and WPA workers was a direct result of extensive activities in national defense work including the military program employing thousands from the selective service rolls. The full extent of this was not anticipated during the spring, so the loss of all Clearwater operation CCC camps during the season and the inability to secure more than a handful of WPA workers were serious handicaps. One of the more disrupting incidents was the closing of a CCC spike camp only a few days after its establishment and the loss of several CCC crews immediately after completion of their training.

Another factor, protracted rains, was one that had never been experienced in such extremes since the program was started. The immediate result was the loss of considerable time on ribes eradication due to unsuitable working conditions. This situation was in time further aggravated in the regular and cooperative camps by the large turnover of workers due to dissatisfaction with low earnings derived from the reduced work time. In turn, this placed added burdens of training and job direction on the supervision, all of which ended in increased costs.

### ORGANIZATION AND ADMINISTRATION

The blister rust control field headquarters at Pierce, Idaho, was opened on April 21. This served as the operation headquarters for all blister rust control work and as the warehouse and supply base for all Bureau camps.

All warehousing and supply for Forest Service blister rust work were handled at the Pierce Ranger Station warehouse which is the Forest Service central supply depot.

The first camp was established May 6, and all camps were in the field by June 16. Considerable difficulty was encountered in moving equipment to the field. The roads were in very poor condition due to rain, but since men had been ordered, the camps had to be established. The blister rust control personnel of the Bureau and Forest Service worked in close cooperation in establishing camps and all other phases of the work.

For the first time since 1932, the Bureau operated cooperative camps on the Clearwater operation. These consisted of two 35-man units financed by a combination of federal, state and private funds. In addition, the Bureau had one 20-man WPA camp financed by Emergency Relief Appropriation funds.

Camps operated by the Forest Service included three 33-man camps and one 66-man unit. All of these were maintained with regular funds appropriated specifically for blister rust control work.

The CCC program consisted of crews from one state and two Forest Service CCC camps. The state camp, located at Brown Creek, furnished three 20-man crews until the camp was discontinued. A 50-man spike camp was established at Moose City from the North Fork Forest Service camp. The spike camp was closed a few days after it was manned due to the discontinuation of the main camp. A spike camp from the Bungalow Camp was established at Upper Beaver Creek.

The personnel, other than supervisory, were hired differently for the three classes of camps. Workers in WPA camps were certified relief men assigned by the Work Projects Administration. Men for the cooperative camps were hired through the orfice of the Idaho State Forester. Workers for the Forest Service camps were hired mainly through the United States Employment Service although a quota of 30 per cent forestry school students was planned prior to the field season. This quota was not filled, the maximum employed from this source reaching only about five per cent.

Most of the WPA workers were quite old for woods work, but care in selection of work area for them resulted in very satisfactory accomplishments. The cooperative camp men were nearly 100 per cent inexperienced, and many were well below the general minimum age requirement of 18 years. After an intensive training period, however, they did satisfactory work. Personnel for the Forest Service camps were not up to last years standard. This was due primarily to defense activities having absorbed a large percentage of the experienced and otherwise more desirable employees.

All ribes eradication work during the past season was performed on cutover and white pine reproduction areas. The Clearwater work plans call for the protection of these younger stands before moving to the older and less threatened age classes. Camps under the jurisdiction of the Bureau performed work mostly on cutover areas while the Forest Service camps worked chiefly in stands of reproduction.

# Number of Comps - 2 Number of Men - 48 2-F-C.C.C. Forest Officer F-0000 Comps U.S. FOREST SERVICE Unit Supervisor Emil Keck David Kyle 4-F. S. Reg. Camps Number of Camps - 4 Number of Men - 161 F. S.-REG. CHART OPERATION Number of Comps - 1 Number of Men --53 I-S.-C.C.C. Comp ORGANIZATION S.-C. C. C. CLEARWATER I-E.Q.-E.R.A. Comp BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE Technicol Supervisor F. J. Heinrich Number of Camps - i Number of Men - 31 E. Q.-E.R. A. 2- E.Q.-Coop. Comps Checking Supervisor H. J. Faulkner I-E.Q.-E.R.A. Checker 2-F.S.-Reg. Checkers I- E.Q.-Coop. Checker Number of Camps - 2 Number of Men - 69 E.Q.-COOP.

Total Number of Men on Blister Rust Work - 362



The ERA camp was located on Poorman Creek and worked entirely on cutover area which contained a heavy population of <u>Ribes viscosissimum</u>. Although working conditions were difficult in places, the bushes were quite large and visibility was good. The pine on this area carries light infection generally, with heavy localized spots.

One of the cooperative camps was located on Upper White Pine Creek and worked on cutover land in that drainage. Although this area has been logged for ten years, the ribes seed are still germinating. Because of this the working was for the best possible results without any attempt toward eradication to the maintenance standard. This camp was moved August 20 to a spike camp site near the Clearwater Timber Protective Association headquarters.

The second cooperative camp was located at the Pierce blister rust control headquarters. Part of the area worked by this unit lay adjacent to camp, and the remainder, which was reached by truck haul, was several miles distant.

The Forest Service regular camps worked on Lolo, Musselshell, Sylvan, Joy, Dead Mule, Tumble, Lodge and Tamarack Creek drainages. In addition they worked part of the Upper Beaver Creek plantation. On all of these areas except Sylvan Creek, ribes are on the decline, so the work was planned to achieve maintenance standards. It is believed that the majority of the acreage worked by this group of camps will carry the pine through to maturity with very little additional work.

The Forest Service CCC crews worked areas near the Bungalow Ranger Station, Upper Beaver Creek and at Moose City near the mouth of Moose Creek. The state CCC crews worked areas in the Grasshopper, Reed and Orofino Creek drainages. Three 20-man crews from the state camp were used for part of the season, but the camp was discontinued before completion of the field work. All work by the state CCC's was done on recently cutover areas.

# METHODS AND EQUIPMENT

Considerable attention was given to the use of the one-man crew during the past season. Two variations of this were used. In one case strings were laid in advance from 10 to 12 feet apart, and one man was placed in each strip. The crew of 10 to 12 men worked somewhat in formation with a foreman in charge. In the other, each man laid his own string from a common base with each crewman carrying his own string ball. Each crewman worked independently and without regard for the location of other workers. His procedure was to work a strip while progressing in one direction and lay the string line for the next strip on the return trip. The men making up the crew were not held in formation, thus giving the faster men an opportunity to move more rapidly. Most of the strips and all portions of each strip that previously supported ribes were reworked by a mop-up man. This gave an excellent check on each individual's work. It is believed that the one-man crew method has possibilities in that it definitely fixes responsibility and encourages individual effort.

### PREERADICATION SURVEY

During the fall months after the camps were closed considerable time was spent by the permanent personnel in inspecting specific areas within the control boundary. This did not include a systematic survey but rather a general sampling based on previous recorded data.

The Soundough sales area located in T. 40 N., R. 7 E., was inspected carefully this year in order to determine if protection should be attempted at this time. The area was logged in 1939-1940 with only white pine being removed. There remains a medium to heavy overwood consisting of white pine seed trees, cedar poles and allied species. There are some white pine seedlings becoming established in direct association with ribes. The ribes germination will be prolonged due to the variation in ground disturbance and overwood densities.

To protect this area would call for yearly workings for several years. Furthermore when the cedar poles are removed the disturbance created would cause another heavy germination of ribes resulting in costly control measures. Under the present conditions it does not seem advisable to undertake control measures until the cedar poles are removed.

# CHECKING AND PINE DISEASE SURVEY

The checking work included the regular activities, namely, advance, regular and post check. In addition, pine disease survey work, which in previous years has been conducted as a separate project, was incorporated as a function of the checking organization. This necessitated few changes other than additional training of checking personnel.

Standardized methods and procedures were employed in checking most areas. Those approaching a maintenance standard were more intensively checked than those recognized as requiring future workings. No systematic checks were run on recently cutover lands where the ribes population was still increasing. Pine disease survey field work was carried on in conjunction with post checking work. Advance surveys were run before eradication work on all areas where recent ribes information was not available.

Regular check was run following eradication on 5,598 acres of upland area. The average cost per acre for this check was \$0.131 per acre.

Combining disease survey and post checking appears to be both timely and economical for it results in the procurement of disease information and ribes data at the same time, and for the consideration of these together in control planning. The requirements for disease survey on the operation this year were small due to the large amount of area covered by pine disease survey crews during 1940.

Following are reports by drainages for areas surveyed during 1941:

# Upper North Fork of Clearwater River, T. 41 N., R. 11 E.

No ribes eradication work has been done in this area. The topography is quite steep and the site only fair for white pine growth. A fairly well-stocked stand of pine occurs on the first one-quarter to one-half mile of the slopes over most of the area.

Ribes petiolare generally distributed along the streams varies from light to heavy in abundance. Upland ribes are predominantly  $\underline{R}$ . Lacustre averaging about 100 per acre.

Acres in area	700
Miles of strip	2.7
Number trees examined	1,356
Number trees infected	773
Per cent infection	57
Per cent reinfection	28
Number cankers found	4,915

Damage in this area is not as heavy as the per cent of infection and reinfection would indicate. The rust became established prior to 1933, but the build-up was slow up to 1937 with 93 per cent of the infection originating in 1937, 1938 and 1939. The stand was approximately 15 years old in 1937 and passing the age where extremely heavy damage would result from two or three waves of infection. Approximately 28 per cent of the infected trees had probable damaging cankers and 16 per cent of the trees examined were classified as being damaged. However, 1940 and 1941 infection will probably raise the per cent of damage considerably.

# Big Horn Area, T. 38 N., R. 8 E.

This area supports a well-stocked stand of 20 year old white pine reproduction. Blister rust became established in 1929 and increased until 25 per cent of the trees were infected by 1934 when first eradication work was done. The 1934 eradication did not materially slow the progress of the rust, for by 1939 the per cent of infected trees had reached 72.5, with approximately 50 per cent having probable damaging cankers.

Working conditions are very difficult due to steepness of slopes and windfall and heavy brush intermingled with numerous  $\underline{R}$ .  $\underline{\text{viscosissimum}}$  plants. In view of these factors and the large amount of pine infection, it is doubtful if future workings would be justified.

Acres in area	500
Miles of strip	.25
Number trees examined	262
Number trees infected	190
Per cent infection	72.5
Per cent reinfection	50
Number cankers found	1,570

# Upper Beaver Creek Area, T. 39 N., R. 5 E.

This area was logged during 1929 and 1930. Large numbers of R. viscosissimum and R. lacustre came in following the logging and brush disposal operations. Pine reproduction is only fair and somewhat spotted due to a heavy stand of old fir and cedar left standing on parts of the area. Blister rust became established in 1932 but spread very slowly up to 1937 when a heavy intensification occurred. The 1938 rework on two parts of this area succeeded in slowing the progress of the rust considerably during 1938 and 1939. On the third part the rust continued to increase at a fairly rapid rate during 1938 and 1939.

	Area Number and Year of Eradication								
	(1)	(2)	(3)						
Class of Data	1934	1934, 1938	1935, 1938						
Acres in area	640	720	560						
Miles of strip	.4	.9	1.1						
No. trees examined	127	154	277						
No. trees infected	6l	42	85						
Per cent trees infected	48	27	31						
Per cent trees reinfected	17	1	5						
No. cankers found	395	105	193						

Ribes average approximately 40 per acre over most of the area, and a future eradication will be necessary before protection is established.

# Upper Beaver Creek Plantation, T. 39 N., R. 5 E.

White pine was cut from this area in 1929, leaving a residual stand of old decadent fir and cedar. This was felled in 1936 after which the area was broadcast burned. In 1937 and 1938 white pine and spruce were planted on the treated area by the Forest Service which acquired ownership of the land following logging. The broadcast burn was not of sufficient intensity to preclude large numbers of R. viscosissimum and some R. lacustre germinating during the first year of planting and to a lesser extent in the succeeding two to three years. Therefore, partial eradications were performed in 1938 and 1939, but due to the large number of seedlings and small bushes, protection could not be established. A thorough eradication was done in 1941, the bushes being reduced to less than seven per acre and live stem to five feet per acre.

Due to the very young age of the pine when infection took place, practically 100 per cent of the infected trees will be killed.

Acres in area	800
Miles of strip	1.5
Number trees examined	674
Number trees infected	44
Per cent infection	6.5
Per cent reinfection	None
Number cankers found	79

A small amount of maintenance work should be sufficient to protect this area in the future.

## Yoosa Creek Area, T. 35 N., R. 7 E.

This area supports a fairly well-stocked stand of 40 year old white pine pole. There is a scattered overstory of mature white fir over parts of the area which has suppressed the white pine in the immediate vicinity. It is this suppressed pine which carries most of the infection on the area. Ribes are predominantly R. lacustre occurring along streams and other moist places with only scattered suppressed R. viscosissimum in the upland. The combined average of all species is about 20 per acre.

Acres in area	400
Miles of strip	1.1
Number trees examined	172
Number trees infected	37
Per cent infection	21.5
Per cent reinfection	3
Number cankers found	67

Due to the advanced age of the stand and species of ribes involved, it is doubtful if future work will be necessary in this area. If future surveys show that the rust is increasing to the point where damage is likely to occur, eradication in the stream type and stream zone would be sufficient to fully protect the area.

#### CANKER ELIMINATION

The pruning of infected limbs from white pine for the purpose of decreasing secial production and saving trees that would otherwise soon be lost, was practiced this year for the first time on the Clearwater operation. The work was performed by a few WPA workers before the ribes eradication season started. A 13 year old stand on the Powder House area, T. 37 N., R. 5 E., sec. 22, was selected for this work. This stand contains localized spots of heavy infection, most of which occurred on the lower branches. The sanitation procedure was to remove the lower third of the crown and any individual cankers above that point, as well as all trees with trunk cankers. All branches were cut close to the trunk with hand shears. Results of this show a total of 11,480 trees treated with 25 man-days of labor. In addition 175 trees, which were already severely damaged by trunk cankers, were removed.

#### STATEMENT OF EAPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941 CLEARWATER OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$62,954.95
	Regular	8,775.63
Bureau of Entomology Regular-Coop.	Regular-Coop.	2,128.01
and Plant Quarantine Idaho-ERA	Idaho-£Ra	14,407.62
	Total	25,511.26
Idaho	State	2,583.05
CTPA	Private	6,566.32
	Total	8,949.37
All Agencies	Total	\$97,195.58

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941 CLEARWATER OPERATION

Ponoc	+	Buroom	of Tintomoli	Satt and	Contrathutod	
O CO TO T		Dalaaa	Dareau of Encomples, and	Jesy alla	מסוופד ד ממהממ	
Service		Pla	Plant Quarantine	ine	Funds	
					Idaho	
Regular	Re	Regular	ERA	Total	and CTPA	Total
\$ 1,350.00 \$ 6,000.00	9 ⇒	5,000.00		\$ 6,000.00		₩ 7,350.00
12,994.48			\$ 871.24	871.24		13,865.72
Wages, temp. laborers 35,560.84		1,975.06		9,100.64 11,075.70 \$8,949.37	\$3,949.37	53,585.91
12,595.02		1,978.28	2,445.86	4,424.14		16,817.16
1,569.66		25.42	73.85	97.27		1,666.93
970.09		379.67	942.79	1,322.46		2,292.55
96.86		547.21	975.24	1,520.45		1,617.31
\$62,934.95	\$10	),903.64	率14,407.62	\$25,311.26	\$62,934.95 \$10,905.64 \$14,407.62 \$25,311.26 \$3,949.57 \$37,195.58	\$37,195.58

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS
CLEARWATER OPERATION

Program	Number of Effective Man-Days	Expend: According		Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 4,500.00	
FS-Reg.	7,109	FS-Reg.	61,272.26	\$8.62
Cooperative	2,784	Idaho CTPA EQ-Reg. EQ-RegCoop. Total	2,583.05 6,366.32 4,275.63 2,128.01 15,353.01	
EQ-ERA	657	EQ-ERA	6,077.25	9.25
ccc	2,529	FS-Reg.	1,662.69	CCC Funds Not Included
Pine Disease Survey	85	EQ-ERA	799.00	9.40
Canker Elimination	25	EQ-ERA	237.50	9.50
Winter Project	302	EQ-ERA	7,293.87	9.10
Total Cost of 1941 1	Program		\$97,195.58	

	Forest Service	Bureau
Number of meals served	57,447	22,009
Average cost per meal	\$0.216	\$0.211
Pounds of twine used	2,205	2,501
Pounds of chemical used	5,489	405



#### SUMMARY OF RIBES ERADICATION, 1941 CLEARWATER OPERATION

## TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	_		Effective Man-Days	Total Ribes	Gallons Spray	Pe:	Remaining r Acre Live Stem
Open Reproduction	92	3,976	607	4,675	8,181	651,829		11.5	17.0
Cutover		2,540	1,223	3,763	4,298	376,905		19.4	30.0
All Upland	92	6,516	1,830	8,438	12,479	1,028,734		13.5	20.3
Stream (Hand)		208		208	265	17,174			
Stream (Chemical)		199		199	335	15,084	5,028		
All Stream		208		208	600	32,258			
All Types	92	6,724	1,830	8,646	13,079	1,060,992		13.5	20.3

## TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Man-	r Acre Ribes	Basis Gallons Spray	Pe	Remaining r Acre Live Stem
Open Reproduction	92	357	30,610		3.88	333			
		TABI	LE 3B - S	SECOND W	ORKIN	}			
Open Reproduction	3,976	6,987	580,345		1.76	146		6.3	7.6
Cutover	2,540	2,937	264,419		1.16	104		21.0	37.1
All Upland	6,516	9,924	844,764		1.52	130		9.5	13.9
Stream (Hand)	208	265	17,174		1.27	83			
Stream (Chemical)	199	335	15,084	5,028	1.68	76	25		
All Stream	208	600	32,258		2.88	155			
All Types	6,724	10,524	877,022		1.57	130		9.5	13.9
		TABI	LE 3C - 1	THIRD WO	RKING				
Open Reproduction	607	837	40,874		1.38	67		20.1	32.8
Cutover	1,223	1,361	112,486		1.11	92		17.9	23.0
All Upland	1,830	2,198	153,360		1.20	84		19.4	29.7



TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
CLEARWATER OPERATION

			1				Per Ac	re Basis		Ribes I	Remaining
			Effective	Total	Gallons			Gallons	_		r Acre
Working	Class	Acres	Man-Days	Ribes	Spray	Days	Ribes	Sprayed	Area	Bushes	Live Stem
First	F-CCC	92	357	30,610		3.88	333				
	EQ-ERA	398	606	58,906		1.52	148			15.1	37.0
	FS-Reg.	3,112	6,374	569,954	1,464	2.05	183	11		6.3	7.6
0	EQ-Coop.	2,048	1,492	89,899	405	.73	44	17			
Second	F-CCC	148	484	24,032	3,159	3.27	162	43			
	S-CCC	1,018	1,568	134,231		1.54	132			23.5	37.1
	Total	6,724	10,524	877,022	5,028	1.57	130	25		9.5	13.9
	EQ-ERA	40	51	3,300		1.28	-				
	FS-Reg.	566	735	37,585		1.30	66			5.3	3.7
mb 4 4	EQ-Coop.	1,173	1,292	107,776		1.10				23.7	37.8
Third	F-CCC	41	102	3,289		2.49	80				
	S-CCC	10	18	1,410		1.80	141				
	Total	1,830	2,198	153,360		1.20				19.4	29.7
	EQ-ERA	438	657	62,206		1.50	142			15.1	37.0
	FS-Reg.	3,678	7,109	607,539	1,464	1.93	165	11		6.2	7.0
All	EQ-Coop.	3,221	2,784	197,675		.86	-	17		23.7	37.8
Workings	F-CCC	281	943	57,931	3,159	3.36	206	43			
	S-CCC	1,028	1,586	135,641		1.54	+			23.5	37.1
	Total	8,646	13,079	1,060,992	5,028	1.51	123	25		13.5	20.3

TABLE 5

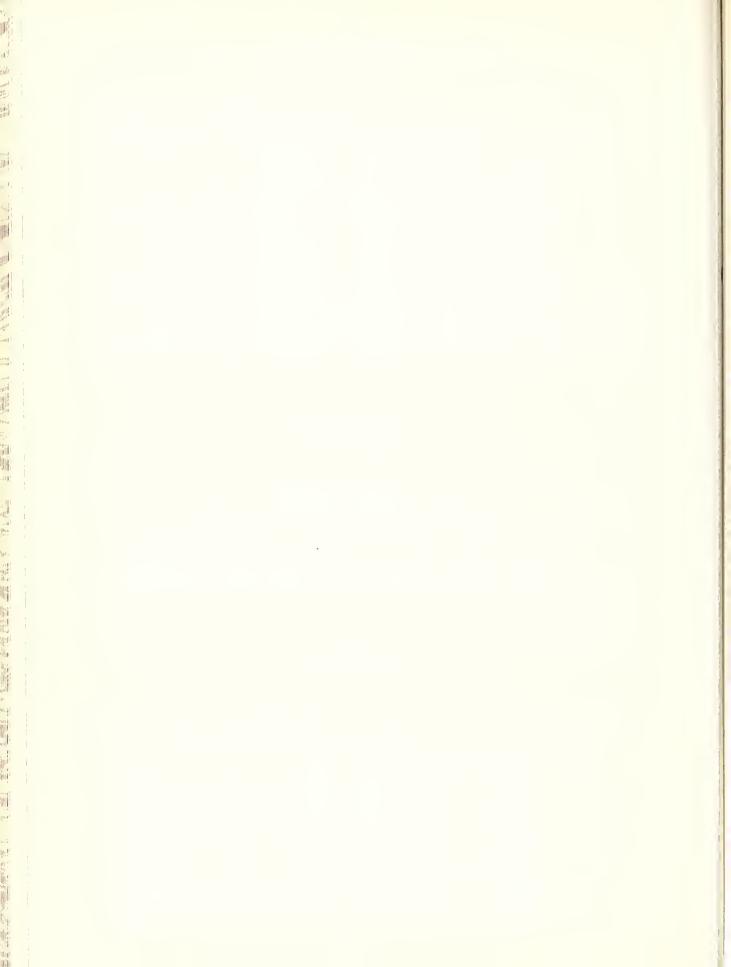
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
CLEARWATER OPERATION

				Numbe	r of Ac	res Worke	ed			
		1	Ву	By Burea	u of En	tomology				
1		Forest	Service	and Pl	ant Qua	rantine		Total		
1		Forest		Forest			Forest			
State	Working	Service	Private	Service	State	Private	Service	State	Private	Total
	First	92					92			92
Idaho	Second	3,245	15		190	3,274	3,245	190	3,289	6,724
Idano	Third	527	80	360		863	887		943	1,830
	Total	3,864	95	360	190	4,137	4,224	190	4,232	8,646

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
CLEARWATER OPERATION

				Ribes by S	Species		
			Ribes	Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum	petiolare	irriguum	Ribes
First	Open Reproduction	92	13,891	16,719			30,610
	Open Reproduction	3,976	189,893	389,546	906		580,345
	Cutover	2,540	43,818	209,653	10,726	222	264,419
Second	All Upland	6,516	233,711	599,199	11,632	222	844,764
	Stream	208	17,174		15,084		32,258
	All Types	6,724	250,885	599,199	26,716	222	877,022
	Open Reproduction	607	15,487	25,317	56	14	40,874
Third	Cutover	1,223	32,755	79,347	384		112,486
Inira	All Upland	1,830	48,242	104,664	440	14	153,360
	All Types	1,830	48,242	104,664	440	14	153,360
	Open Reproduction	4,675	219,271	431,582	962	14	651,829
All	Cutover	3,763	76,573	289,000	11,110	222	376,905
Wanteday	All Upland	8,438	295,844	720,582	12,072	236	1,028,734
Workings	Stream	208	17,174		15,084		32,258
	All Types	8,646	313,018	720,582	27,156	236	1,060,992



## SUMMARY OF RIBES ERADICATION, 1929-1941 CLEARWATER OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

	Acres	Acres	Acres				
	First	Second	Third	Total	Effective	Total	Gallons
Eradication Type	Working	Working	Working	Acres	Man-Days	Ribes	Spray
Open Reproduction	58,463	20,460	2,324	81,247	131,747	35,351,727	
Dense Reproduction	11,088	493		11,581	5,286	1,164,891	
Open Pole	25,677	11,284		36,961	21,382	4,527,630	
Dense Pole	3,534	1,569		5,103	1,553	292,973	
Open Mature	213,980	15,743		229,723	107,122	24,099,942	
Dense Mature	5,309	324		5,633	559	134,244	
Cutover	27,726	32,345	6,002	66,073	66,285	21,185,916	
Brush	2,795	79		2,874	2,578	732,633	
Burn	1,045	432		1,477	1,777	1,285,330	
Subalpine	122			122	118	53,948	
Meadow-Field	1,890			1,890			
All Upland	351,629	82,729	8,326	442,684	338,407	88,829,234	
Stream (Hand)	41,606	21,935	2,174	65,715	62,904	14,019,434	
Stream (Chemical)	14,430	5,709	498	20,637	38,397	2,670,705	890,035
Stream (Slash)	65	13		<b>7</b> 8	1,258	188,983	
Stream (Zone)		1,666		1,666	1,129	280,094	
All Stream	41,671	23,614	2,174	67,459	103,688	17,159,216	
All Types	393,300	106,343	10,500	510,143	442,095	105,988,450	

TABLE 7A - FIRST WORKING

					Per	r Acre	Basis					
		Effective	Total	Gallons	Man-		Gallons					
Eradication Type	Acres	Man-Days		Spray	Davs	Ribes	Spray					
					_ • -							
Open Reproduction	58,463	99,254	31,966,183		1.70	547						
Dense Reproduction	11,088	5,214	1,161,593	-	.47	105						
Open Pole	25,677	15,201	3,600,567		.59	140						
Dense Pole	3,534	937	185,062		.27	52						
Open Mature	213,980	99,387	23,291,483		.46	109						
Dense Mature	5,309	493	130,871		.09	25						
Cutover	27,726	25,888	10,610,089		.93	383						
Brush	2,795	2,536	729,247		.91	261						
Burn	1,045	1,246	917,609		1.19	878						
Subalpine	122	118	53,948		.97	442						
Meadow-Field	1,890											
All Upland	351,629		72,646,652		.71	207						
Stream (Hand)	41,606		11,105,816		1.05	267						
Stream (Chemical)	14,430				2.08	159	53					
Stream (Slash)	65		188,983			2,907						
All Stream	41,671		13,595,654		1.80	326						
All Types	393,300	325,403	86,242,306		.83	219						
ALL Types   393,300  325,403   86,242,306    .83   219												
	TA	ABLE 7B - S	SECOND WORK	ING								
Open Reproduction	20,460	29,495	3,138,521		1.44	153						
Dense Reproduction	493	72	3,298		.15	7						
Open Pole	11,284	6,181	927,063		.55	82						
Dense Pole	1,569	616	107,911		.39	69						
Open Mature	15,743	7,735	808,459		.49	51						
Dense Mature	324	66	3,373		.20	10						
Cutover	32,345	33,547	9,772,134		1.04	302						
Brush	79	42	3,386		.53	43						
Burn	432	531	367,721		1.23	851						
All Upland	82,729	78,285	15,131,866		.95	183						
Stream (Hand)	21,935	17,459	2,678,255		.80	122						
Stream (Chemical)	5,709	7,988	355,177	118,459		62	21					
Stream (Slash)	13	25			1.92							
Stream (Zone)	1,666	1,129	280,094		.68	168						
All Stream	23,614	26,601	3,313,526		1.13	140						
All Types	106,343	104,886	18,445,392		.99	173						
		·										
	TA	ABLE 7C - 1	THIRD WORKIN	IG								
Open Reproduction	2,324	2,998	247,023		1.29	106	[					
Cutover	6,002	6,850	803,693		1.14	134						
All Upland	8,326	9,848	1,050,716		1.18	126						
Stream (Hand)	2,174	1,604	235,363		.74	108						
Stream (Chemical)	498	354	14,673	4,891	.71	29	10					
All Stream	2,174	1,958	250,036		.90	115						
All Types	10,500	11,806	1,300,752		1.12	124						
		12,000	_,000,.00		****	- LNI						



TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1941
CLEARWATER OPERATION

							Per A	cre Basis
		l	Effective	Total	Gallons	Man-		Gallons Per
Working	Class	Acres	Man-Days	Ribes	Spray	Days	Ribes	Sprayed Area
	FS-Reg.	11,303		6,328,090	18,060		560	72
	EQ-NIRA	19,009	12,345	5,679,694	13,361	- 65	299	69
	FS-NIRA	41,460	33,021	12,605,276	11,694	.80	304	79
	EQ-ERA	62,640	60,861	14,881,129	75,622	.97	238	77
First	FS-ERA	2,503	3,769	1,427,903		1.51	570	
	EQ-Coop.	91,453	59,665	18,267,124	283,158	.65	200	36
	F-CCC	66,586	62,203	12,966,444	153,039	.93	195	59
	S&P-CCC	98,346	76,474	14,086,646	211,751	.78	143	87
	Total	393,300	325,403	86,242,306	766,685	.83	219	53
	FS-Reg.	20,671	21,865	3,005,555	8,400	1.06	145	21
	EQ-NIRA	1,076	660	159,890	3,355	.61	149	45
	FS-NIRA	2,498	2,342	175,212	8,007	.94	70	21
Second	EQ-ERA	45,919	45,007	9,000,921	42,399	.98	196	28
	FS-ERA	8,249	5,184	514,730	2,044	.63	62	27
	EQ-Coop.	6,891	4,390	643,009	10,958	.64	93	3
	F-CCC	10,563	12,639	1,500,100	21,162	1.20	142	44
	S&P-CCC	10,476	12,799	3,445,975	22,134	1.22	329	19
	Total	106,343	104,886	18,445,392	118,459	.99	173	15
	FS-Reg.	1,292	1,291	102,138		1.00	79	
	FS-NIRA	914	747	127,700	1,922	.82	140	3
	EQ-ERA	5,326	6,404	676,459	2,110	1.20	127	19
Third	FS-ERA	284	319	44,201	348	1.12	156	3
IIIIIu	EQ-Coop.	1,173	1,292	107,776		1.10	92	
	F-CCC	724	880	77,248	511	1.22	107	2
	S&P-CCC	787	873	165,230		1.11	210	
	Total	10,500	11,806	1,300,752	4,891	1.12	124	9
	FS-Reg.	33,266	40,221	9,435,783	26,460	1.21	284	41
	EQ-NIRA	20,085	13,005	5,839,584	16,716	.65	291	62
	FS-NIRA	44,872	36,110	12,908,188	21,623	.80	288	36
All	EQ-ERA	113,885	112,272	24,558,509	120,131	.99	216	46
Workings	FS-ERA	11,036	9,272	1,986,834	2,392	.84	180	13
workings	EQ-Coop.	99,517	65,347	19,017,909		.66	191	26
	F-CCC	77,873	75,722	14,543,792		,97	187	53
	S&P-CCC	109,609	90,146	17,697,851		.82	161	66
	Total	510,143	442,095	105,988,450		.87	208	39

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1941
CLEARWATER OPERATION

	Number	of Acre	es Worke	l by Ownership	Classes	
		Federal				
	Forest	Public				
Working	Service	Domain	Total	State - Idaho	Private	Total
First	148,186	3,680	151,866	78,834	162,600	393,300
Second	47,445	628	48,073	14,808	43,462	106,343
Third	3,660	12	3,672	883	5,945	10,500
All						
Workings	199,291	4,320	203,611	94,525	212,007	510,143

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1941
CLEARWATER OPERATION

Ownership Class		per of Act		Acres Mature Stands on Which Working Is Deferred	Total Acres
Forest Service	148,186	47,684	195,870	8,860	204.730
Public Domain	3,680	350	4,030		4,030
Subtotal Federal	151,866	48,034	199,900	8,860	208,760
State	78,834	2,956	81,790	11,200	92,990
Private	162,600	17,710	180,310	27,940	208,250
Total	393,300	68,700	462,000	48,000	510,000

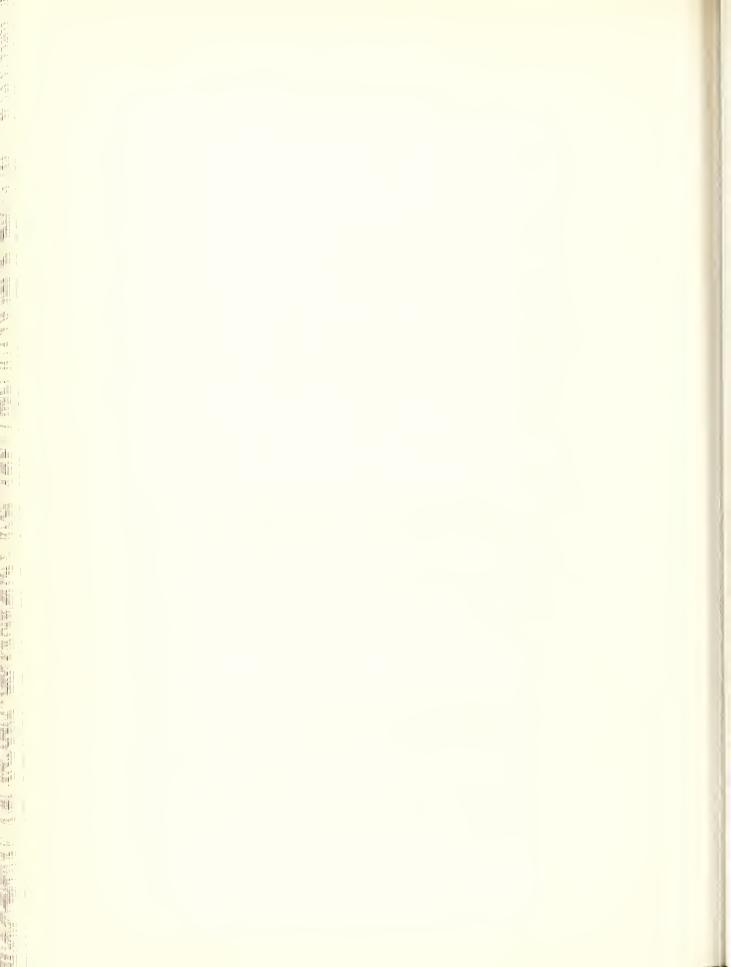


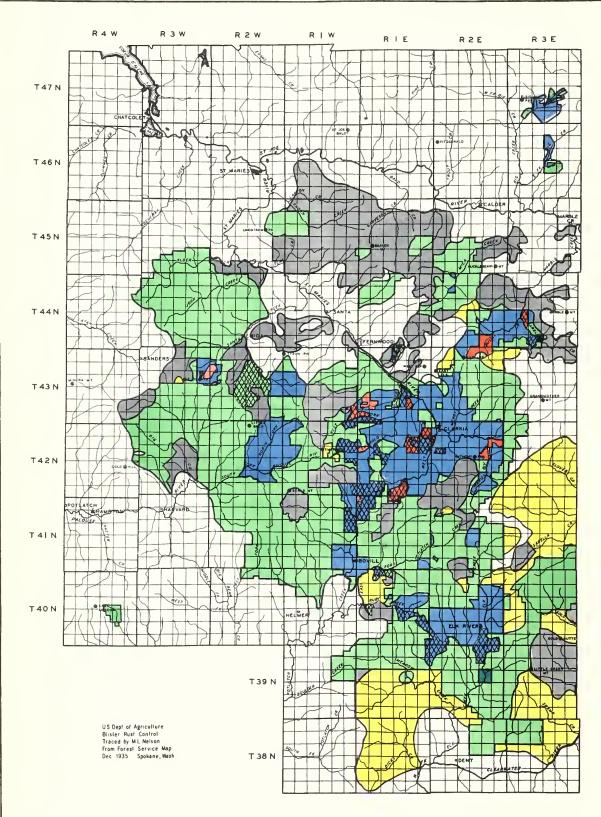
TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1941
CLEARWATER OPERATION

				Rib	es by Spec	i es			
			Ribes	Ribes	Ribes	Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum			irriguum		Ribes
	Open Reproduction	58,463	7,585,779	24,149,751	73,506	41,600	115,547	İ	31,966,183
	Dense Reproduction			980,480	2,457		15,584		1,161,593
	Open Pole	25,677		1,221,117	31,301	6	7,090	462	3,600,567
	Dense Pole	3,534	127,043	57,703	316		, , , , , , , , , , , , , , , , , , , ,		185,062
	Open Mature		16,156,577	6,773,065	197,117	107,057	57,641	26	23,291,483
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cutover	27,726	2,100,601	8,431,923	38,603	27,752	11,210		10,610,089
First	Brush	2,795	210,516	490,931	17,270	114	10,416		729,247
	Burn	1,045	74,796	838,377	568		3,868		917,609
İ	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	351,629	28,911,622	42,966,233	361,853	183,120	223,336	488	72,646,652
	Stream	41,671	9,861,025	324,255	2,683,146	701,834	25,394		13,595,654
	All Types	393,300	38,772,647	43,290,488	3,044,999	884,954	248,730	488	86,242,306
	Open Reproduction	20,460	693,076	2,433,398	12,007	4	36		3,138,521
	Dense Reproduction	493	102	3,192	4				3,298
	Open Pole	11,284	395,523	518,636	12,653	1	250		927,063
ĺ	Dense Pole	1,569	101,801	2,734	3,376				107,911
C	Open Mature	15,743	392,150	400,158	15,768	116		267	808,459
	Dense Mature	324	3,058	315					3,373
Second	Cutover	32,345	1,131,459	8,554,796	77,458	724	7,697		9,772,134
	Brush	79	424	2,962					3,386
	Burn	432	19,437	342,837	5,447				367,721
İ	All Upland	82,729	2,737,030	12,259,028	126,713	845	7,983	267	15,131,866
	Stream	23,614	1,882,577	516,470	821,946		9,141	6,676	3,313,526
	All Types	106,343	4,619,607	12,775,498	948,659	77,561	17,124	6,943	18,445,392
-	Open Reproduction	2,324	126,520	118,555	1,934		14		247,023
	Cutover	6,002	123,762	665,269	14,519		143		803,693
Third	All Upland	8,326	250,282	783,824	16,453		157		1,050,716
	Stream	2,174	178,214	2,038	46,968	22,816			250,036
Ī	All Types	10,500	428,496	785,862	63,421	22,816	157		1,300,752
	Open Reproduction	81,247	8,405,375	26,701,704	87,447	41,604	115,597		35,351,727
	Dense Reproduction	11,581	157,448	983,672	2,461	5,726	15,584		1,164,891
	Open Pole	36,961	2,736,114	1,739,753	43,954	7	7,340	462	4,527,630
	Dense Pole	5,103	228,844	60,437	3,692				292,973
	Open Mature	229,723	16,548,727	7,173,223		107,173	57,641	293	24,099,942
	Dense Mature	5,633	107,931	22,753	715		1,980		134,244
All	Cutover	66,073	3,355,822	17,651,988	130,580	28,476	19,050		21,185,916
Workings	Brush	2,874	210,940	493,893	17,270	114	10,416		732,633
	Burn	1,477	94,233	1,181,214	6,015		3,868		1,285,330
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	442,684	31,898,934	56,009,085	505,019	183,965	231,476	755	88,829,234
	Stream	67,459	11,921,816	842,763	3,552,060	801,366	34,535	6,676	17,159,216
	All Types	510,143	43,820,750	56,851,848	4,057,079	985,331	266,011	7,431	105,988,450

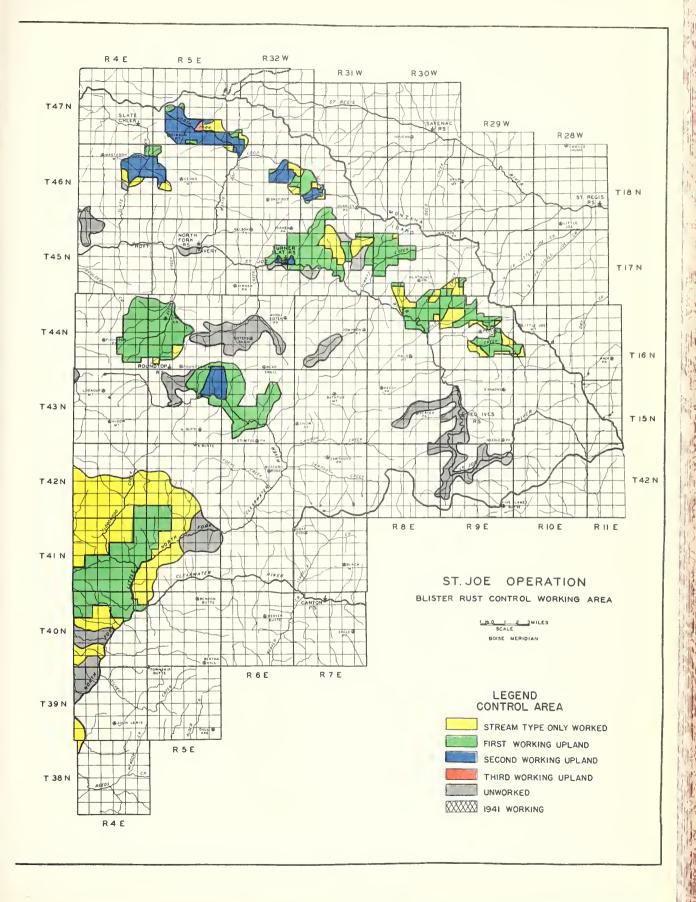






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BLISTER RUST CONTROL WORK, ST. JOE OPERATION, 1941 By

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#### INTRODUCTION

Blister rust threatens the destruction of many of the young western white pine stands on the St. Joe operation. Sufficient funds have not been available to do the necessary ribes eradication work on all of the areas so efforts have been concentrated on completing and maintaining control on the better areas of western white pine in the younger age classes.

Blister rust control work was continued on this operation for the thirteenth consecutive year. To date the initial eradication of ribes has been completed on 535,867 acres and subsequent rework on 134,639 acres. There remain 349,058 acres of unworked area of which 90,460 acres are mature timber which will not require any ribes eradication until after logging.

Control work on the St. Joe operation was carried on by four classes of camps during the 1941 season. Ten 33-man and three 66-man camps financed by regular Forest Service funds operated for the average period of May 25 to September 10. Three CCC main camps were scheduled to participate in control activities starting June 15. Two of these camps were discontinued in midsummer and ribes eradication work in the third was hampered materially by depleted enrollment. One 15-man ERA camp financed by the Bureau of Entomology and Plant Quarantine and one 66-man cooperative camp operated from late May until early September.

#### ORGANIZATION AND ADMINISTRATION

All control work on the St. Joe operation was organized and administered according to the cooperative working plan. Full responsibility for the administration of the regular Forest Service camps and the supervision of the field work for the CCC camps rested with the Forest Service. The Bureau administered the technical supervision for all Forest Service regular and CCC camps, and operated and supervised the ERA and cooperative camps. A checking supervisor from the Bureau was in charge of the checking activities for all camps administered by both agencies. The accompanying organization chart sets forth in detail the administrative system of the operation.

The field headquarters at Clarkia, Idaho, maintained by the Bureau, were used as an operating base for all Bureau and some Forest Service activities. The Forest Service field headquarters and supply base were maintained at the Clarkia Ranger Station.

To provide the best available class of labor in the Forest Service regular camps, former employees whose services were satisfactory during the past year were sent application forms. Applicants who indicated that they would be

available were called directly by name. About 50 per cent of this group railed to report when called. Inexperienced men were obtained from applicants interviewed by responsible members of the operation and through the State Employment Service. Nearly 70 per cent of the men employed were inexperienced. As the season progressed, the labor turnover increased and the quality of available labor greatly decreased. Many older men and boys of 17 and 18 years of age were employed, and on the average the quality of the workers was lower than in any previous season.

Many crew leaders and laborers were transferred to ranger districts of the St. Joe National Forest for fire guard and lookout duty. The labor turnover, amounting to more than 100 per cent, caused a great amount of added expense and lost motion. The very heavy rains which fell throughout May, June and September greatly aggravated the personnel problem and delayed field work.

The average age of the men employed in the cooperative camp was 18 years, and work was a new experience for all. On an average it required one month of training and conditioning for each man before satisfactory production was reached. These men will be very desirable workers next season.

All blister rust control personnel were trained and organized for fire suppression work.

#### LOCATION AND DESCRIPTION OF AREAS

Large-scale western white pine logging operations continue in the St. Joe and Clearwater regions. There are eight major western white pine logging operations and numerous small ones within the control boundaries of the St. Joe operation. Nearly one-half of these cuttings are taking place on areas that have been protected from blister rust. In a few cases 60 year old stands of private timber are being logged by small operators. On many of the logging operations the readily accessible mixed species of good quality are being harvested along with the western white pine, but in general the cuttings do not open up the forest canopy sufficiently to allow development of western white pine reproduction. However, an abundant and flourishing ribes population usually develops and heavy blister rust infection soon occurs. No attempt has been made to establish control on any areas logged since 1932, as these areas usually represent very high cost control work and their western white pine productivity is very questionable due to the heavy residual stand of inferior species. The majority of these areas have been set aside until partial disposal of defective and unmerchantable species or additional logging has taken place.

All control efforts in 1941 were concentrated on the protection of high-quality, well-established pole and reproduction stands. Broadly speaking, the ribes population on these areas had reached a state of equilibrium. The first working areas average 255 ribes per acre while the second working areas averaged 58 ribes per acre. The majority of the camps were engaged on second eradication. Only five camps were employed on initial ribes eradication work which was chiefly confined to western white pine plantations. Areas included in the 1941 control program were in the St. Maries River and the Marble, Potlatch and Elk Creek drainages.

## 2-F.S. Reg Camps 3-F.-C.C.C. Comps Forest Officer Merrill D. Oaks Number of Camps - 13 F. S.-REG. Forest Officer U. S. FOREST SERVICE 5-F.S. Reg. Camps Walter J. Pierce Unit Supervisor Donald J. Moore Number of Camps - 3 Number of Men - 110 6-F.S. Reg. Camps Byron C. Amsbaugh Unit Supervisor F.- C. C. C. ORGANIZATION CHART ST. JOE OPERATION Number of Comps - 1 I-E.Q.-Coop. Camp I-E.Q.-E.R.A. Camp H.J. Hartman Technical Supervisor John C. Gynn Ass<sup>1</sup>t. Operation Supervisor E.Q-E.R.A. BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE 2-F.S.-Reg. Checker Foremen 8-F.S.-Reg. Checkers Number of Comps - 1 E. Q.-COOP. Checking Supervisor W.F. Pointer

Total Number of Men on Blister Rust Work - 740

Number of Men - 14

Number of Men - 66

Number of Men - 550



#### METHODS AND EQUIPMENT

Hand pulling and chemical-spray were the two methods of ribes eradication employed. Each man engaged on hand eradication was equipped with an improved ribes pick and in some cases with dry chemical for decapitation work. All employees engaged in the actual application of each method were given intensive training by the supervisory personnel in order to perform the most efficient ribes eradication job possible. At the start of the season all supervisory personnel attended a training school of three days' duration. One day was devoted to first aid training.

The practice of laying string lines in advance of the hand eradication crews was continued in many of the camps. This practice was particularly adaptable where inexperienced and poor quality workers were involved.

Both two and three-man crews were used. When three-man units were employed each crew was assigned to a small block which they worked independently of other crews. Their work was supervised by the camp boss and his assistant.

In most camps two-man crews were used with a straw boss to each three crews. The three two-man crews worked side by side in individual strips and as individual crews with the straw boss working behind. The straw boss further trained and supervised his crews and reworked their strips. This method appeared to give the best results under existing conditions.

Five tons of Atlacide with Tergitol as a "spreader" were sprayed on Ribes petiolare by means of the knapsack spray unit. All chemical was used on second and third working areas.

This year an extensive accident prevention program was inaugurated which called for the enforcement of a safety code and other improved safety practices. A decrease of 40 per cent in the number of lost-time accidents resulted which was due chiefly to the educational effect on individual employees in regard to their woods conduct and the immediate and proper treatment of minor injuries.

A large-scale ribes eradication methods experiment was conducted in order to determine the proper size of crew, most suitable width of strip and the most practical method of laying string lines for open reproduction and brush types. The results of this experiment will be the subject of a special report.

#### PREERADICATION SURVEY

A stocking survey was made on nearly all areas which are being considered for blister rust control work in 1942 with the objective of obtaining more detailed information relative to stocking and working conditions. The field method consisted of running parallel strips ten chains apart across the areas. The presence of white pine and of all other species was tallied on a four-milacre unit at the end of each chain along the strips. During the season 49,000 acres were surveyed at an average cost of 4.3 cents per acre. The survey was financed from regular Forest Service funds. These data will be used in blister rust control and silvicultural planning.

#### CHECKING AND PINE DISEASE SURVEY

The checking of ribes eradication areas was continued during 1941 with no deviation from the standard checking methods practiced in 1940. To maintain a high quality of check on worked areas, checkers were systematically checked throughout the summer.

Six checkers of the 17 who checked in 1940 returned for the 1941 season. Four more were trained and additional men would have been trained if qualified material had been available. By mid-August the organization consisted of six checkers and one checker foreman for 18 camps. In spite of the shortage of checkers, areas were checked with the same degree of efficiency regardless of the amount of area available for checking. The constant need of men for regular check limited post check activities to areas included in the 1941 work plan. A total of 24,583 acres was covered by a regular check at a cost of \$0.17 per acre. A total of 10,953 acres was post checked at a cost of \$0.09 per acre.

In addition to the regular checking activities pine disease survey became an added activity of the checking organization in 1941. A three-day training school was conducted at Clarkia, Idaho in July, during which R. L. MacLeod outlined the general methods and procedure for disease survey and assisted in the practice field work. Three checkers, who were to be the nucleus of the disease survey crew, were trained during this period. In September when checking work was discontinued two disease survey crews of three men each were organized. The work was confined to areas not previously surveyed and plantation areas.

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Results of the disease survey work and other pertinent data for each area inspected are included in the following summaries:

## Ramskull Creek Drainage, T. 43 N., R. 3 W., secs. 13, 24; T. 43 N., R. 2 W., secs. 7, 18, 19

This drainage was logged in 1928 and 1929 and broadcast burned in 1930. The area was snagged in 1935 and 1936 by CCC's, broadcast burned in the fall of 1936, and planted by CCC's in the spring of 1937 and 1938. An unsatisfactory burn over the upper limits of the drainage made planting conditions quite severe due to the remaining felled snags and heavy brush. Such conditions also made ribes eradication very difficult. The entire snagged area was somewhat spot-planted with white pine on the north slopes and yellow pine on the south slopes. Some spruce was planted along the creek bottoms. The first eradication was performed in 1938 by CCC's. The second eradication by CCC's followed in 1940 due to the large number of ribes seedlings resulting from the burn following snagging. At present most of the area is on a rework status due to the number of seedlings present. The survival of white pine on areas which were heavily burned is excellent, but on the non-burned and heavy brush areas few pine are present. A summary of the disease survey follows:



W 29. Conditions following the logging of a 60 year old western white pine stand near Clarkia, Idaho. All ribes had been removed from this stand but this logging disturbance will cause light ribes regeneration from stored seed.



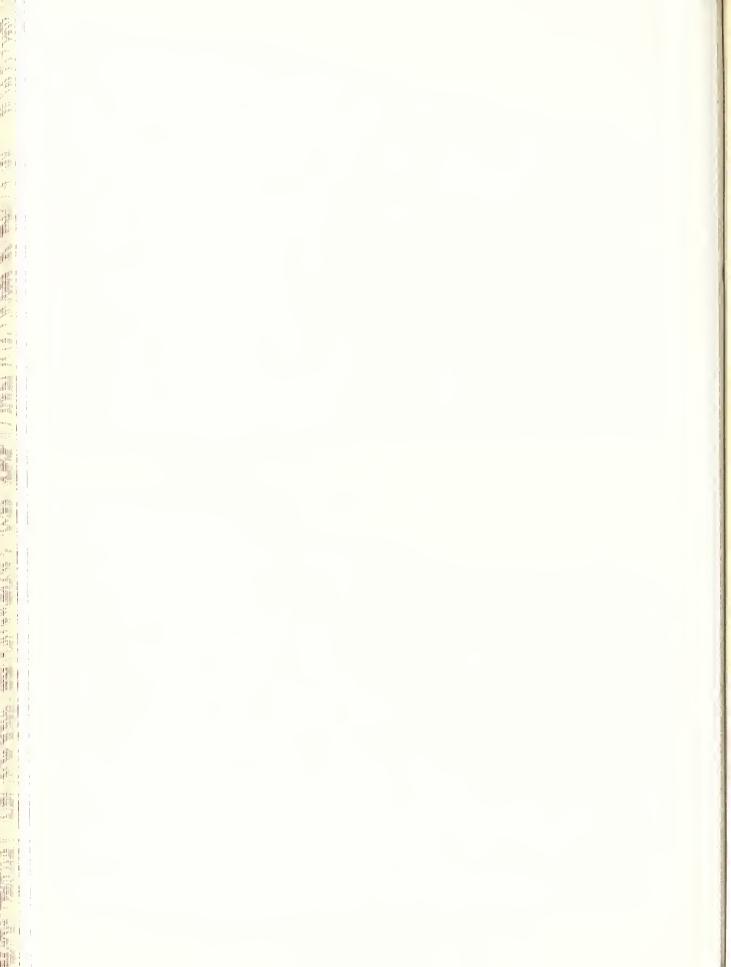
W 148. Typical 66-man blister rust control camp. Cooperative camp at Squaw Meadows in 1941.







W 1606, 1606-6. Two pictures of the same western white pine natural reproduction stand showing the ecological change that has taken place in only six growing seasons (1935-1941). The density of the stand will soon be sufficient to preclude the occurrence and reproduction of ribes.



Acres surveyed in drainage	700
Miles of survey strip	7
Number of trees examined	4,126
Number of trees infected	69
Per cent trees infected	1.7
Number of cankers found	78

With the exception of 14 trees all infection found in the drainage was on small pine reproduction that survived the fire following snagging. Trunk cankers prevail, and there is reason to believe that few infected trees will survive.

## Charlie Creek Drainage, T. 43 N., R. 2 W., secs. 10, 15, 16, 21, 28

The area was logged from 1926 to 1928 and broadcast burned in 1928 or 1929. Snagging of the area was started by the CCC's in the fall of 1939 and continued in the spring of 1940. The felled snags were never burned. Planting of all of the area snagged was not necessary due to a sufficient amount of reproduction that became established following the burn in 1928 or 1929. However, 435 acres were planted to western white pine in the fall of 1940 and 933 acres in the spring of 1941.

Two regular Forest Service camps, a 33-man and one 66-man, were established in the drainage in 1941 to cover the areas of natural reproduction and the planted areas. The final check on worked areas indicated that six bushes with 11 feet of live stem per acre remained. A summary of the disease survey follows:

Acres surveyed in drainage	900
Miles of survey strip	10
Number of trees examined	4,171
Number of trees infected	61
Per cent trees infected	1.5
Number of cankers found	74

# East Fork of Potlatch Creek, T. 41 N., R. 1 E., secs. 33, 34; T. 40 N., R. 1 E., secs. 3, 4, 5

This area was burned for the second time in 1929. No information is available as to the date of the first burn, but it is assumed it followed logging. The area was planted in the fall of 1933. The survival of planted trees was satisfactory following the second inspection in September, 1936. Approximately one-half of the area was eradicated of ribes in 1934. The reworking of this area plus the initial working of additional area was performed in 1941. An analysis of the disease survey follows:

Acres surveyed in drainage	550
Miles of survey strip	6
Number of trees examined	3,437
Number of trees infected	267
Per cent trees infected	7.8
Number of cankers found	384

# Keeler Creek Drainage, T. 41 N., R. 1 E., secs. 3, 4; T. 42 N., R. 1 E., secs. 34, 35

Except for the lower portion of this drainage all cover is natural reproduction, fairly well stocked. The lower portion of the drainage, which represents about one third of the area surveyed, was planted in 1934. The west half of the drainage was spot logged in 1937, the white pine being removed. A semi-broadcast burn followed logging. Ribes eradication was performed in the drainage in 1933, 1938 and 1941. The final check for areas worked in 1941 indicated that four bushes and six feet of live stem per acre remained on the upland type with 15 bushes and 43 feet of live stem per acre on the stream. A summary of the disease survey follows:

Acres surveyed in drainage	800
Miles of survey strip	9
Number of trees examined	6,189
Number of trees infected	459
Per cent trees infected	7.4
Number of cankers found	608

#### STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941

ST. JOE OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$204,583.53
	Regular	12,725.26
Bureau of Entomology	Regular-Coop.	2,600.25
and Plant Quarantine	Idaho-ERA	15,097.00
	Total	30,422.51
Idaho	State	2,921.22
PTPA	Private	5,107.46
	Total	8,028.68
All Agencies	Total	\$243,034.72

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941 ST. JOE OPERATION

	Forest	Bureau	Bureau of Entomology and	gy and	Contributed	
					Idaho	
Item	Reguler	Regular	ERA	Total	and PTPA	Total
Salaries, permanent men	\$ 6,440.00 \$ 8,533.30	\$ 8,533.30		\$ 8,533.30		\$ 14,973.30
Salaries, temporary men	*		\$ 2,965.66	2,965.66		2,965.66
Wages, temporary laborers	150,909.91	2,384.84	7,091.07	9,475.91	\$8,028.68	168,414.50
Subsistence supplies	33,974.16	3,253.44	2,849.91	6,103.35		40,077.51
Equipment	7,339.47	27.15	111.70	138.85		7,478.32
Travel and transportation	1,701.96	372.67	855.71	1,228.38		2,930.34
Chemicals	1,204.97					1,204.97
Twine	2,189.86					2,189.86
Other supplies	823.20	754.11	754.11 1,222.95 1,977.06	1,977.06		2,800.26
Total	\$204,583.53	\$15,325.51	\$15,097.00	\$30,422.51	\$204,583.55 \$15,325.51 \$15,097.00 \$30,422.51 \$9,028.68 \$243,034.72	\$243,034.72

\*Included with wages, temporary laborers

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS ST. JOE OPERATION

	Number of Effective		itures	Effective Man-Day
Program	Man-Days	According		Cost
Planning, Coordination,				
and Technical Direction		EQ-Reg.	\$ 6,244.98	
FS-Reg.	26,046	FS-Reg.	203,425.35	\$7.81
		Idaho	2,921.22	
		PTPA	5,107.46	
Cooperative	2,704	EQ-Reg.	6,250.28	6.24
		EQ-RegCoop.	2,600.25	
		Total	16,879.21	
		EQ-ERA	1,826.50	
EQ-ERA	281	EQ-Reg.	230.00	7.32
		Total	2,056.50	1
CCC	2,683	*FS-Reg.	1,158.18	
EQ-ERA, Winter Project		EQ-ERA	13,270.50	
Total Cost of 1941 Prog	ram		\$243,034.72	

<sup>\*</sup>CCC funds not included

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	Forest Service	Bureau
Number of meals served	134,313	27,491
Average cost per meal	\$0.253	\$0.222
Pounds of twine used	6,144	980
Pounds of chemical used	10,360	200

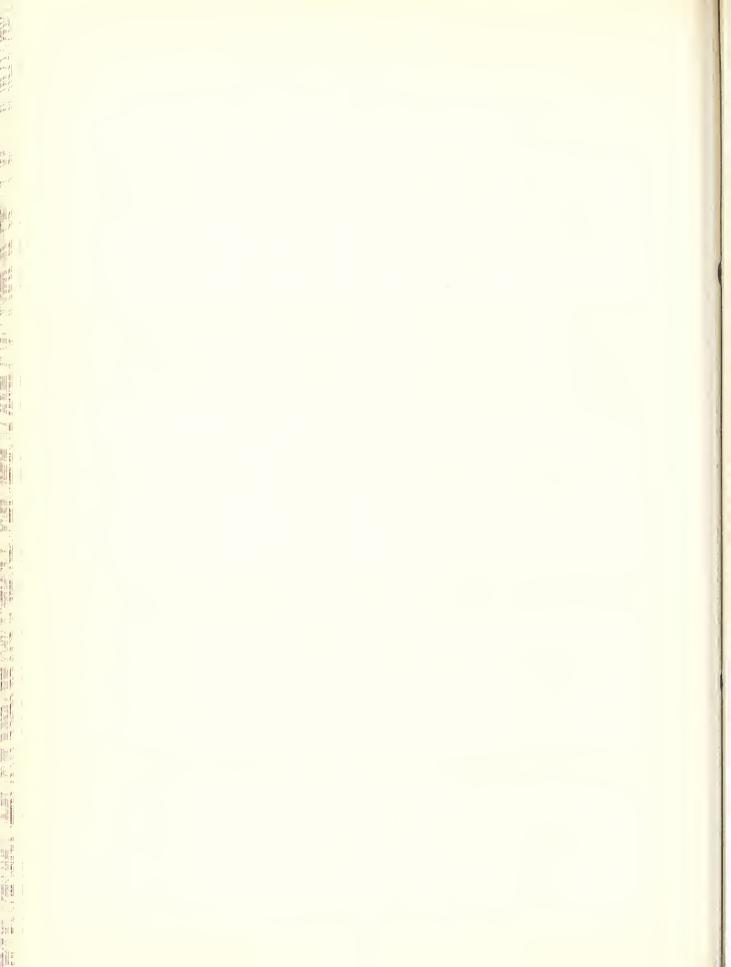
## SUMMARY OF RIBES ERADICATION, 1941 ST. JOE OPERATION

## TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working		Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Pe	Remaining r Acre Live Stem
Open Reproduction	4,152	10,333	2,724	17,209	23,907	2,061,453		6	17
Dense Reproduction	47	930	44	1,021	432	14,991		4	20
Open Pole	200	3,162	539	3,901	2,258	69,982		3	11
Dense Pole	502	160		662	48	584		1	1
Open Mature	20	450	117	587	882	87,848		6	11
Cutover		164	230	394	697	67,580		3	4
All Upland	4,921	15,199	3,654	23,774	28,224	2,302,438		5	16
Stream (Hand)	114	453	242	809	3,098	228,220		18	46
Stream (Chemical)	20	228	113	361	392	23,037	7,679		
All Stream	114	453	242	809	3,490	251,257		18	46
All Types	5,035	15,652	3,896	24,583	31,714	2,553,695		6	16

#### TABLE 3A - FIRST WORKING

						Per	Acre I	Basis	Ribes 1	Remaining
The distance of			Effective	Total	Gallons			Gallons	1	r Acre
Eradication Type		Acres	Man-Days	Ribes	Spray	Days	Ribes	Spray	Bushes	Live Stem
					1					
Open Reproduction		4,152	6,969	1,112,215		1.68	268		8	15
Dense Re	production	47	50	3,668		1.06	78		4	10
Open Pol	Le	200	39	6,252		.20	31		7	13
Dense Po	ole	502	2	197		.01	1		0	0
Open Mat	ure	20	66	8,803		3.30	440		0	0
All Upla	and	4,921	7,126	1,131,135		1.45	230		7	15
Stream (	Hand)	114	1,491	150,209		13.08	1,318		21	29
	Chemical)	20	78	2,025	675	3.90	101	34		
All Stre		114	1,569	152,234		13.76	1,335		21	29
All Type	8	5,035	8,695	1,283,369		1.73	255		8	15
			TABI	LE 3B - SE	COND WOR	KING				
Open Rep	roduction	10,333	12,476	732,805		1.21	71		6	18
Dense Re	Dense Reproduction		381	11,313		.41	12		4	21
Open Pol	Open Pole		1,986	59,309		.63	19		3	11
Dense Pole		160	46	387		.29	2		1	1
Open Mat	ure	450	526	44,465		1.17	99		6	11
Cutover		164	158	6,119		.96	37		1	3
All Upla		15,199	15,573	854,398		1.02	56		5	16
Stream (		453	769	44,391		1.70	98		19	41
	Chemical)	228	209	12,855	4,285	.92	56	19		
All Stre	am	453	978	57,246		2.16	126		19	41
All Type	8	15,652	16,551	911,644		1.06	58		5	16
			TAE	BLE 3C - TE	HIRD WORK	KING				
	roduction	2,724	4,462	216,433		1.64	79		6	16
	production	44	1	10		.02	1		0	0
Open Pol		539	233	4,421		.43	8		5	7
Open Mat	ure	117	290	34,580		2.48	296		0	0
Cutover		230	539	61,461		2.34	267		3	4
All Upla		3,654	5,525	316,905		1.51	87		6	14
Stream (		242	838	33,620		3.46	139		14	42
Stream (	Chemical)	113	105	8,157	2,719	.93	72	24		
All Stre		242	943	41,777		3.90	173		14	42
All Type	s	3,896	6,468	358,682		1.66	92		6	15



#### SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941 ST. JOE OPERATION

			Effective			Per Acre Baeis				Ribee Remaining		
				Totel	Gellone	Man-		Gellons	Per	Pe	r Acre	
Working	Cless	Acree	Man-Days	Ribes	Sprey	Deys	Ribes	Spreyed .	Aree	Buehee	Live Stem	
	FS-Reg.	4,679	7,153	1,169,344		1.53	250			8	15	
First	F-CCC	356	1,542	114,025	675	4.33	320	34		10	33	
	Totel	5,035	8,695	1,283,369	675	1.73	255	34		8	15	
	EQ-ERA	214	281	19,090		1.31	89			4	25	
	FS-Reg.	12,634	13,289	738,476	4,285	1.05	58	19		4	14	
Second	EQ-Coop.	2,651	2,704	120,704		1.02	46			4	12	
	F-CCC	153	277	33,374		1.81	218			10	31	
	Totel	15,652	16,551	911,644	4,285	1.06	58	19		5	16	
	FS-Reg.	3,658	5,604	275,672	2,719	1.53	75	24		5	13	
Third	F-CCC	238	864	83,010		3.63	349			13	35	
	Totel	3,896	6,468	358,682	2,719	1.66	92	24				
	EQ-ERA	214	281	19,090		1.31	89			4	25	
All	FS-Reg.	20,971	26,046	2,183,492	7,004	1.24	104	21		5	14	
	EQ-Coop.	2,651	2,704	120,704		1.02	46			4	12	
Workings	F-CCC	747	2,683	230,409	675	3.59	308	34		10	32	
	Totel	24,583	31,714	2,553,695	7,679	1.29	104	21		6	16	

TARLE 5

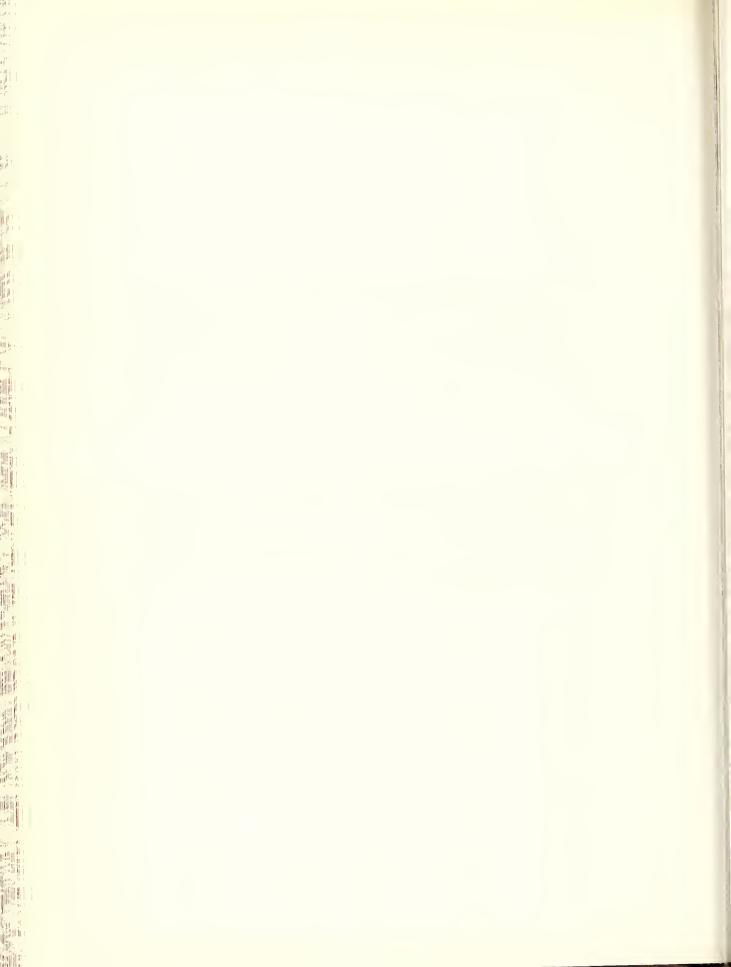
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
ST. JOE OPERATION

							Nu	mber of	Acres	Worke	d						
1		Ву					By Bureau of										1
			Fore	et Serv	vice		Entone	Entomology end Plant Querantine				Totel					
1			ederel					Federel			Federel					}	
1		Forest	Public				Foreet	Public			1	Forest	Public				
Stete	Working	Service	Domein	Totel	Stete	Privete	Service	Domein	Totel	Stete	Privete	Service	Domein	Totel	Stete	Privete	Totel
	D1	4 450		4 450	0.05	200						4.450		4.50	275	700	E 075
	Firet	4,458		4,458	275	302						4,458		4,458	275	302	5,035
Ideho	Second	8,786	200	8,986	1,105	2,696	864	80	944	1,075	846	9,650	280	9,930	2,180	3,542	15,652
таело	Third	1,951		1,951	618	1,327						1,951		1,951	618	1,327	3,896
	Totel .	15,195	200	15,395	1,998	4,325	864	80	944	1,075	846	16,059	280	16,339	3,073	5,171	24,583

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
ST. JOE OPERATION

			Ribes	Ribes	Ribee	Ribes	Ribes	Totel
Working	Eredicetion Type	Acree	lecuetre	viecosieeimum	petiolare	inerme	irriguum	Ribes
	Open Reproduction	4,152	292,174	807,604	115	11,870	452	1,112,21
	Dense Reproduction	47	709	2,941		18		3,668
	Open Pole	200	2,064	4,188				6,25
First	Dense Pole	502	125	72				19
FIFBC	Open Meture	20	6,011				2,792	8,80
	All Upland	4,921	301,083		115	11,988	3,244	1,131,13
	Stream	114	130,981	8,055	2,025	11,173		152,23
	All Types	5,035	432,064	822,860	2,140	23,061	3,244	1,283,36
	Open Reproduction	10,333	230,632	484,045	2,791	8,636	6,701	732,80
	Denee Reproduction	930	8,773		14			11,31
	Open Pole	3,162	40,731	13,645	400	4,529	4	59,30
	Dense Pole	160	271	116				38
Second	Open Mature	450	31,680	3,374	460		8,951	44,46
	Cutover	164	3,591	2,371	17	140		6,11
	All Upland	15,199	315,678	506,077	3,682	13,305	15,656	854,39
	Stream	453	30,931		14,202	11,268		57,24
	All Types	15,652	346,609		17,884	24,573	15,656	911,64
	Open Reproduction	2,724	39,807	169,933	202	6,491		216,43
	Denee Reproduction	44	9	1	L			10
	Open Pole	539	828	3,519	21	53		4,42
Third	Open Meture	117	32,812	32	8		1,728	34,58
Inira	Cutover	230	15,343			2,821		61,46
	All Upland	3,654	88,799	216,782	231	9,365	1,728	316,90
	Stream	242	29,955	84	9,558	2,180		41,77
	All Types	3,896	118,754	216,866	9,789	11,545	1,728	358,68
	Open Reproduction	17,209	562,613	1,461,582	3,108	26,997	7,153	2,061,45
	Dense Reproduction	1,021	9,491	5,468	14	18		14,99
	Open Pole	3,901	43,623	21,352	421	4,582	4	69,98
43.1	Dense Pole	662	396	188			l I	58
All	Open Mature	587	70,503	3,406	468		13,471	87,84
Workings	Cutover	394	18,934	45,668	17	2,961		67,58
	All Upland	23,774	705,560	1,537,664	4,028	34,558	20,628	2,302,43
	Stream	809	191,867	8,984	25,785	24,621		251,25
	All Typee	24,583	897,427	1,546,648	29,813	59,179	20,628	2,553,69



## SUMMARY OF RIBES ERADICATION, 1929-1941 ST. JOE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working		Total Acres	Effective Man-Days		Gallons Spray
Open Reproduction	172,579	66,517	5,703	244,799	321,028	87,701,601	
Dense Reproduction	43,037	4,335	79	47,451	13,083	1,908,977	
Open Pole	63,538	23,940	1,098	88,576	42,798	7,799,578	
Dense Pole	23,300	2,438		25,738	5,501	985,353	
Open Mature	182,314	10,113	170	192,597	85,450	22,547,209	
Dense Mature	9,745	274		10,019	1,614	267,557	
Cutover	1,009	344	230	1,583	1,561	331,297	
Brush	2,452	431		2,883	1,924	679,187	
Burn	2,224	106		2,330	1,164	806,886	
Subalpine	200			200		90,809	
All Upland	500,398	108,498	7,280	616,176	474,539	123,118,454	
Stream (Hand)	34,678	12,602	6,232	53,512	97,334	27,328,357	
Stream (Chemical)	7,404	3,237	606	11,247	26,892	2,385,780	795,260
Stream (Slash)	791	27		818	10,420	409,100	
All Stream	35,469	12,629	6,232	54,330	134,646	30,123,237	
All Types	535,867	121,127	13,512	670,506	609,185	153,241,691	

TABLE 7A - FIRST WORKING

			Effective		Gallons	Man-	r Acre	Gallons
Eradica	ation Type	Acres	Man-Days	Ribes	Spray	Days	Ribes	Spray
Open Rei	production	172,579	230,200	78,656,361		1.33	456	
	eproduction			1,748,192		.26	41	
Open Pol		63,538		6,864,339		.45	108	
Dense Po	ole	23,300		915,716		.20	39	
Open Mat	ture	182,314	77,084	21,433,378		.42	118	
Dense Ma	ature	9,745	1,559	255,434		.16	26	
Cutover		1,009	654	100,332		. 65	99	
Brush		2,452	1,881	676,620		.77	276	
Burn		2,224	1,061	795,464		. 48	358	
Subalpin	ne	200	416	90,809		2.08	454	
All Upla	and	500,398	357,050	111,536,645		.71	223	
Stream	(Hand)	34,678	65,337	20,953,990		1.88	604	
	(Chemical)	7,404	21,683	2,009,118	669,706	2.93	271	90
Stream	(Slash)	791	10,101	395,600		12.77	500	
All Stre	eam	35,469	97,121	23,358,708		2.74	659	
All Type	98	535,867		134,895,353		.85	252	
		9	CABLE 7B -	SECOND WORK	ING			
			_					
Open Ren	production	66,517	83,078	8,693,396		1.25	131	
	eproduction		1,898	159,643		. 44	37	
Open Pol		23,940		916,626		.57	38	
Dense Po		2,438		69,637		.38	29	
Open Mat	ture	10,113		1,075,789		.80		·
Dense Ma	ature	274	55	12,123		.20		
Cutover		344	368	169,504		1.07	493	
Brush		431	43	2,567		.10	6	
Burn		106	103	11,422		.97	108	
All Upla	and	108,498	108,254	11,110,707		1.00	102	
Stream	(Hand)	12,602	22,389	4,836,114		1.78	384	
Stream	(Chemical)	3,237	4,704	333,549	111,183	1.45	103	34
Stream	(Slash)	27	319	13,500		11.81	500	
All Stre	eam	12,629	27,412	5,183,163		2.17	410	
All Type	es	121,127	135,666	16,293,870		1.12	135	
		9	PABLE 7C -	THIRD WORKIN	IG			
Open Ren	production	5,703	7,750	351,844		1.36	62	
	production	79	72	1,142		.91	14	
Open Pol		1,098	549	18,613		.50	17	
Open Mat		170	325	38,042	_	1.91		
Cutover		230	539	61,461		2.34		
All Upla		7,280	9,235	471,102		1.27	65	
Stream		6,232	9,608	1,538,253		1.54		
	(Chemical)	606	505	43,113	14,371	.83	71	24
All Stre		6,232		1,581,366		1.62		~ 1
All Type		13,512	19,348	2,052,468		1.43		
		10,010	10,020	2,002,100		24.10	100	

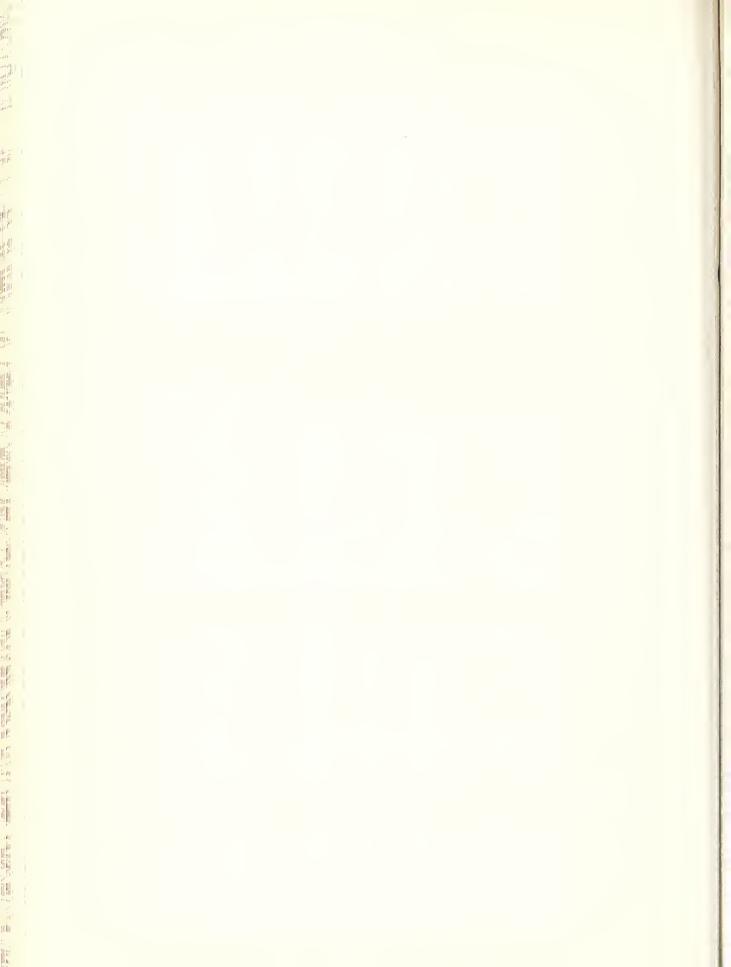


TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1941

ST. JOE OPERATION

					1				
						]	Per Acı	re Basis	
		]	Effective	Total	Gallons			Gallons Per	
Working	Class	Acres	Man-Days	Ribes	Spray		Ribes	Sprayed Area	
	FS-Reg.	86,489		26,035,449			301	95	
	EQ-NIRA	42,366		7,734,978			183	68	
	FS-NIRA	70,714		14,845,626				129	
	EQ-ERA	147,063		29,461,510	52,667	.63	200	113	
First	FS-ERA	267	892	487,480		3.34	1,826		
	EQ-Coop.	17,073	13,484	3,864,001		.79	226	41	
	F-CCC	103,540	136,641	40,639,926	163,378	1.32	393	116	
	S&P-CCC	68,355	50,437	11,826,383	22,590	.74	173	53	
	Total	535,867	454,171	134,895,353	669,706	.85	252	90	
	FS-Reg.	58,142	62,792	6,411,756	39,711	1.08	110	25	
	EQ-NIRA	1,742	1,228	291,131		.70	167		
	EQ-ERA	40,355	35,499	5,649,828	10,557	.88	140	32	
Second	EQ-Coop.	3,140	2,995	169,179	2,674	.95	54	11	
	F-CCC	15,500	28,795	3,316,377	29,289	1.86	214	55	
	S&P-CCC	2,248	4,357	455,599	28,952	1.94	203	54	
	Total	121,127	135,666	16,293,870	111,183	1.12	135	34	
	FS-Reg.	7,920	11,311	944,510	6,849	1.43	119	26	
	EQ-ERA	2,993	2,922	455,940	3,025	.98	152	12	
Third	F-CCC	2,530	5,053	649,160	4,497	2.00	257	46	
	S&P-CCC	69	62	2,858		.90	41		
	Total	13,512	19,348	2,052,468	14,371	1.43	152	24	
	FS-Reg.	152,551	164,325	33,391,715	308,705	1.08	219	67	
	EQ-NIRA	44,108	26,799	8,026,109	10,839	.61	182	68	
	FS-NIRA	70,714	44,246	14,845,626			210	129	
All	EQ-ERA	190,411		35,567,278				64	
Workings	FS-ERA	267		487,480			1,826		
MOLYTHES	EQ-Coop.	20,213	16,479	4,033,180				36	
	F-CCC	121,570		44,605,463	197,164	1.40	367	97	
	S&P-CCC	70,672		12,284,840				53	
	Total	670,506		153,241,691		.91	229	71	

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1941
ST. JOE OPERATION

	Number of Acres Worked by Ownership Classes Federal							
Working	Forest Public							
First	216,158	12,578	228,736	67,082	240,049	535,867		
Second	65,333	4,644	69,977	14,051	37,099	121,127		
Third	7,061	130	7,191	1,383	4,938	13,512		
All Workings	288,552	17,352	305,904	82,516	282,086	670,506		

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1941
ST. JOE OPERATION

		ber of Ac		Acres Mature Stands on Which Working	
Ownership Class	Worked	Unworked	Total	Is Deferred	White Pine
Forest Service	216,158	84,833	300,991	11,089	312,080
Public Domain	12,578	10,847	23,425	1,040	24,465
Subtotal Federal	228,736	95,680	324,416	12,129	336,545
State	67,082	26,973	94,055	20,880	114,935
Private	240,049	135,945	375,994	57,451	433,445
Total	535,867	258,598	794,465	90,460	884,925

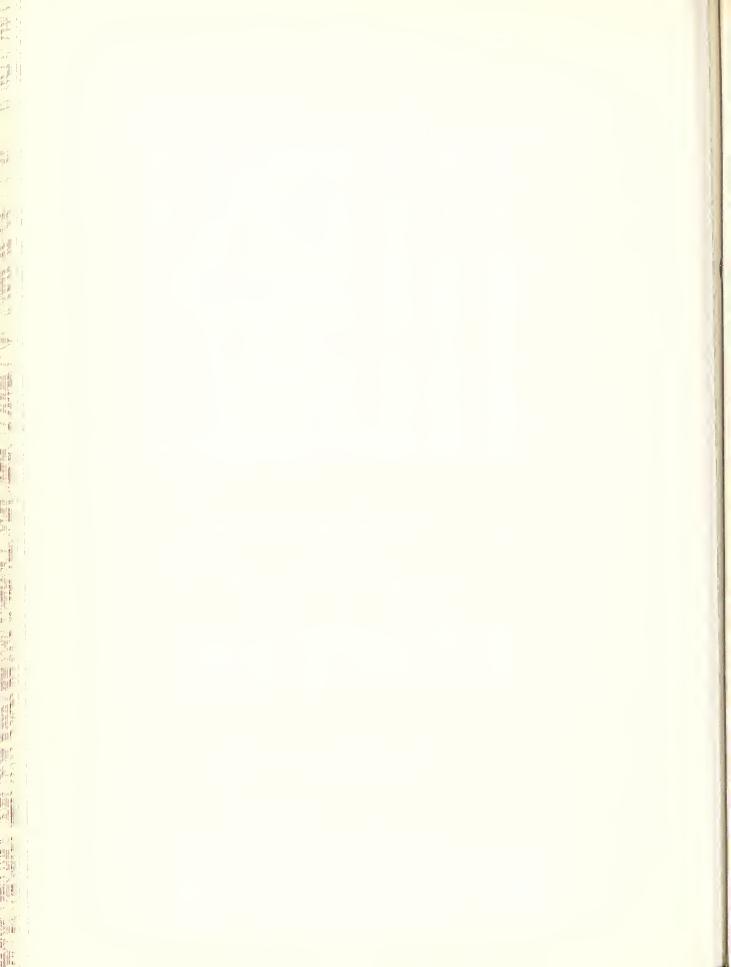
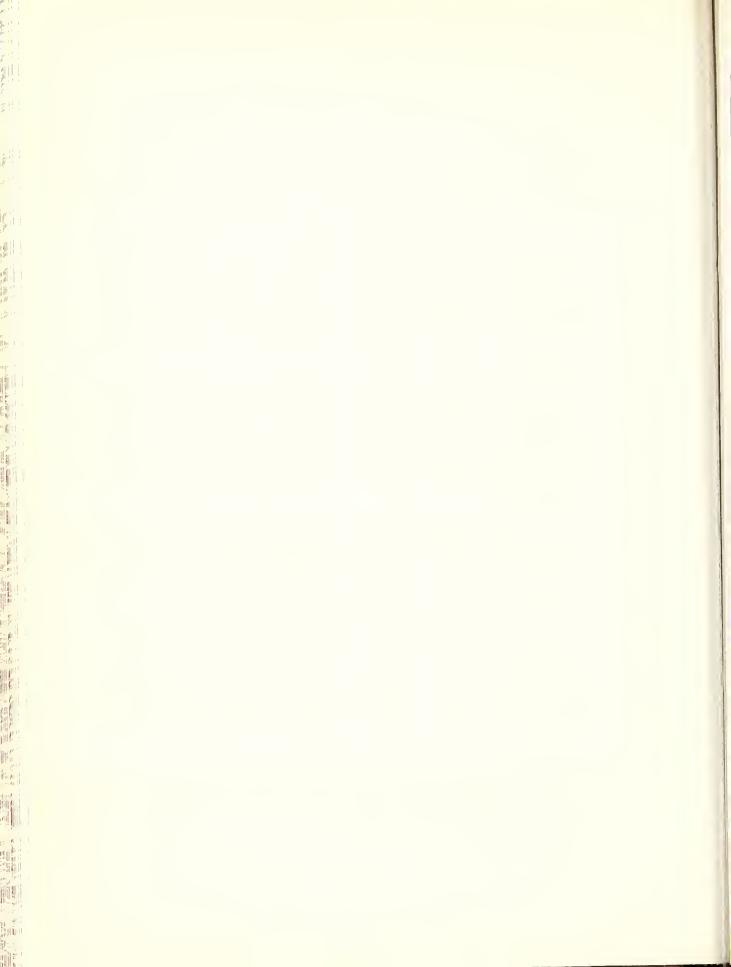
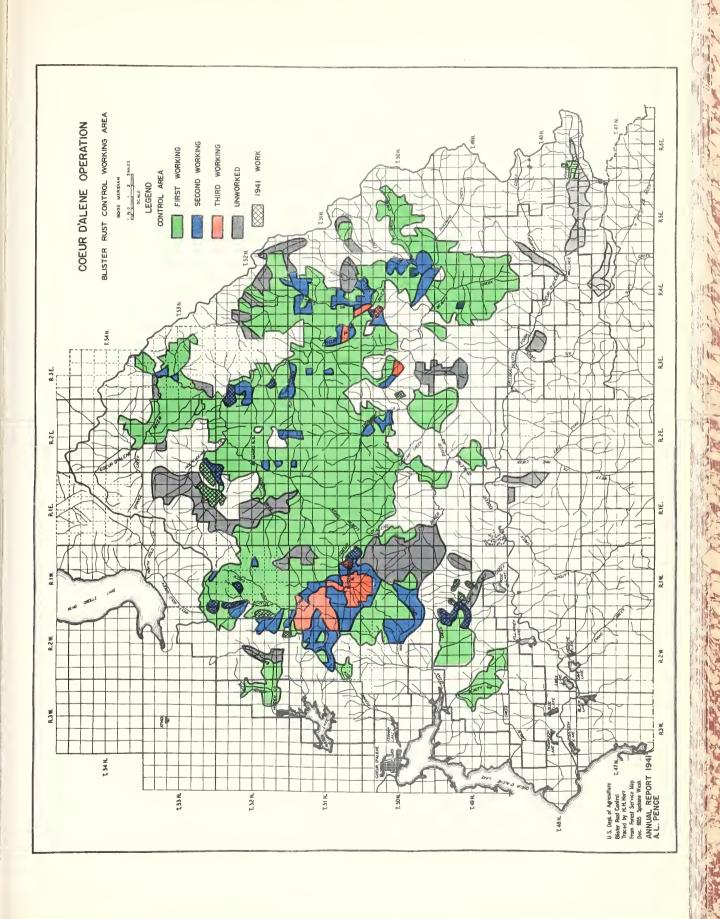


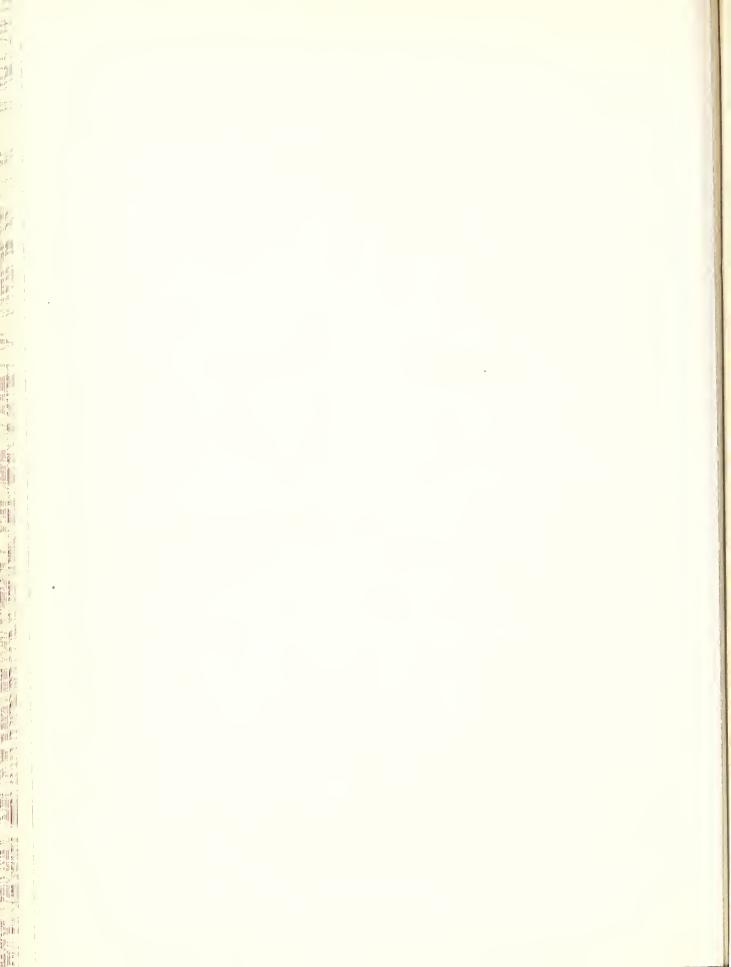
TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1941
ST. JOE OPERATION

				D	dhan her Con				
			Ribes	Ribes	ibes by Spe Ribes		Dibon	Dahan	Total
Working	Eradication Type	Acres	lacustre		1	Ribes inerme	Ribes	Ribes triste	
MOLKING	Fradicacion type	Actes	lacustre	viscosissimum	pectorare	Inerme	irriguum	triste	Kines
	Open Reproduction	172,579	14,304,910	63,796,019	100,260	316,457	138,715		78,656,361
	Dense Reproduction		810,571	881,403	13,310	27,305			1,748,192
	Open Pole	63,538	2,780,166	3,926,050	19,835	61,506	76,782		6,864,339
	Dense Pole	23,300	454,753	457,434	1,335	1,993	201		915,716
	Open Mature	182,314	10,795,826	10,310,260	27,828	42,519			21,433,378
	Dense Mature	9,745	160,499	94,546	389		,		255,434
First	Cutover	1,009	64,897	30,125	5,269	41			100,332
	Brush	2,452	93,470	579,731	1,987	1,432			676,620
	Burn	2,224	133,557	652,633	8,327	947			795,464
	Subalpine	200	54,975	35,834					90,809
	All Upland		29,653,624	80,764,035	178,540	452,200			111,536,645
-	Stream		16,372,384		3,331,826		16,695	132	
	All Types		46,026,008	81,652,064	3,510,366		504,941	132	134,895,353
	Open Reproduction	66,517	3,220,643		34,625	52,205	11,578		8,693,396
191	Dense Reproduction	4,335	80,963	78,568	14	98			159,643
	Open Pole	23,940	448,205	449,056	1,719	17,642	4		916,626
	Dense Pole	2,438	37,660	31,393	584				69,637
	Open Mature	10,113	482,507	560,663	778	19	31,822		1,075,789
Second L	Dense Mature	274	4,629	7,494					12,123
L	Cutover	344	13,241	156,086	17	160			169,504
	Brush	431	456	2,111					2,567
	Burn	106	5,306	6,116					11,422
	All Upland	108,498	4,293,610	6,665,832	37,737	70,124	43,404		11,110,707
-	Stream	12,629	3,038,724		1,080,316	753,469		141,471	5,183,163
	All Types	121,127	7,332,334	6,828,942	1,118,053	823,593	49,477	141,471	16,293,870
	Open Reproduction Dense Reproduction	5,703	132,702	206,489	5,792	6,861			351,844
	Open Pole	79	671	471	70	5.7			1,142
	Open Mature	1,098	6,523	11,999	38	53	3 500		18,613
	Cutover	230	32,990 15,343	3,316 43,297	0	2,821	1,728		38,042
L	All Upland	7,280	188,229	265,572	5,838	9,735	1.728		61,461 471,102
-	Stream	6,232	721,817	22,985	464,056	370,126	1,720	2,382	1,581,366
	All Types	13,512	910,046	288,557	469,894	379,861	1,728	2,382	2,052,468
	Open Reproduction	,	17,658,255	69,376,853	140,677	375,523	150,293	2,002	87,701,601
	Dense Reproduction		892,205	960,442	13,324	27,403	15,603		1,908,977
	Open Pole	88,576	3,234,894	4,387,105	21,592	79,201	76,786		7,799,578
	Dense Pole	25,738	492,413	488,827	1,919	1,993	201		985,353
	Open Mature		11,311,323	10,874,239	28,614	42,538	290,495		22,547,209
T T	Dense Mature	10,019	165,128	102,040	389		,		267,557
All	Cutover	1,583	93,481	229,508	5,286	3,022			331,297
Wanteinaa	Brush	2,883	93,926	581,842	1,987	1,432			679,187
	Burn	2,330	138,863	658,749	8,327	947			806,886
· -	Subalpine	200	54,975	35,834					90,809
	All Upland	616,176	34,135,463	87,695,439	222,115	532,059	533,378		123,118,454
	Stream	54,330	20,132,925	1,074,124	4,876,198 5,098,313			143,985	30,123,237







BLISTER RUST CONTROL WORK, COEUR D'ALENE OPERATION, 1941 By

Neal D. Nelson, Assistant Forest Supervisor, U. S. Forest Service Albert L. Pence, Jr., Associate Forester

### INTRODUCTION

The season of 1941 marked the twelfth year of ribes eradication work and the fifteenth year since experimental work was started on the Coeur d'Alene National Forest. During the period from 1927 to 1941, despite successful control work on much of the area, the rust has now established itself and may be found in every principal drainage of the forest. The intensification varies from scattered infected trees to serious infection centers. The present control program of five or six 33-man camps each year is not adequate to maintain protection for the tull white pine acreage of the forest. Attention is therefore directed to the better sites supporting a good stocking of white pine in the younger age classes.

The loss of two of the three CCC camps during the spring and early summer, and low enrollment in the remaining camp, precluded the assignment of any great number of CCC workers to blister rust control work. Three 20-man crews worked on the activity parts of the season. Five 33-man regular camps were allotted to the forest but continuing rains throughout the season so disrupted the work that an additional 15-man camp was established.

### ORGANIZATION AND ADMINISTRATION

The first camp was started May 5, and the last camp was established on June 16. Most of the camps were closed early in September, and all were out by September 15. Heavy rains during August and September made eradication work almost impossible. The work was organized and administered under the district rangers. To make certain that uniform practices were being used a unit supervisor was employed to work with the rangers. The unit supervisor worked in cooperation with the Technical Supervisor of the Eureau of Entomology and Plant Quarantine in matters pertaining to checking, eradication methods and standards of work.

### LOCATION AND DESCRIPTION OF AREAS

Ribes eradication performed by CCC crews was located near existing camps. A crew working from Nowhere Spike Camp did ribes eradication work on the Nowhere plantation area and a 90-acre block near Rock City. A crew from the Big Creek camp worked in Uranus Creek. The Scott Creek pruning area was subsequently worked in May.

Two of the six regular camps performed second and third workings in the Little North Fork cutover areas, and one camp was engaged in similar work in the Fourth of July Creek area. Two camps initiated work on Trail and Independence Creek areas. The 15-man camp was engaged in first and second work in Owl Creek, a plantation area.

### METHODS AND EQUIPMENT

Methods and equipment as prescribed in the "Ribes Eradication Manual" were generally employed.

One, two and three-man crews were used, depending upon the eradication situation encountered and the calibre of the men. One-man crews were used with marked success wherever ground conditions permitted good visibility.

A "contour method" of covering the strip was devised and used for all sizes of crew. This method consists simply of working a 3 to 15 foot contour strip out between the string lines, always on the uphill side of the crew.

Three checkers worked 617 acres on the Nowhere plantation area, expending only 35 man-days and removing an average of five bushes per acre. These men worked abreast on a strip extending three to seven chains wide. The ground was covered by the crew members shuttling back and forth within the strip. This area was worked early in May before other brush species had leafed out, and it is felt that a better job resulted than would have been obtained later using a crew in closer formation.

Equipment consisted of the pronged pick and the Sheeley ribes hook. Each year trucks for transporting men to and from work are becoming more important. Four of the six camps were supplied with trucks for this purpose.

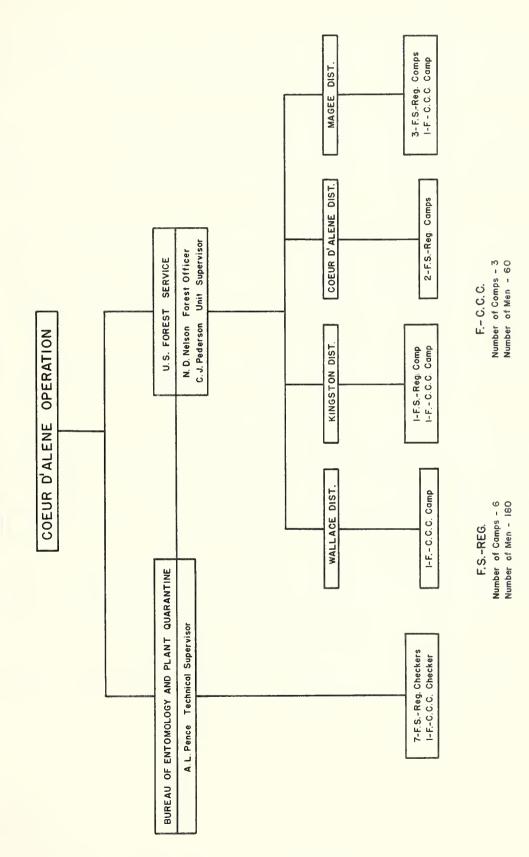
### CHECKING AND PINE DISEASE SURVEY

Disease survey work was carried on intermittently during the summer by two 2-man crews of checkers. After the camps were closed, three 2-man crews were used on this assignment for about one month. Prescribed survey methods were used throughout. In addition, stocking data were taken at the end of each chain on a four milacre quadrat basis on those areas where this information was considered desirable.

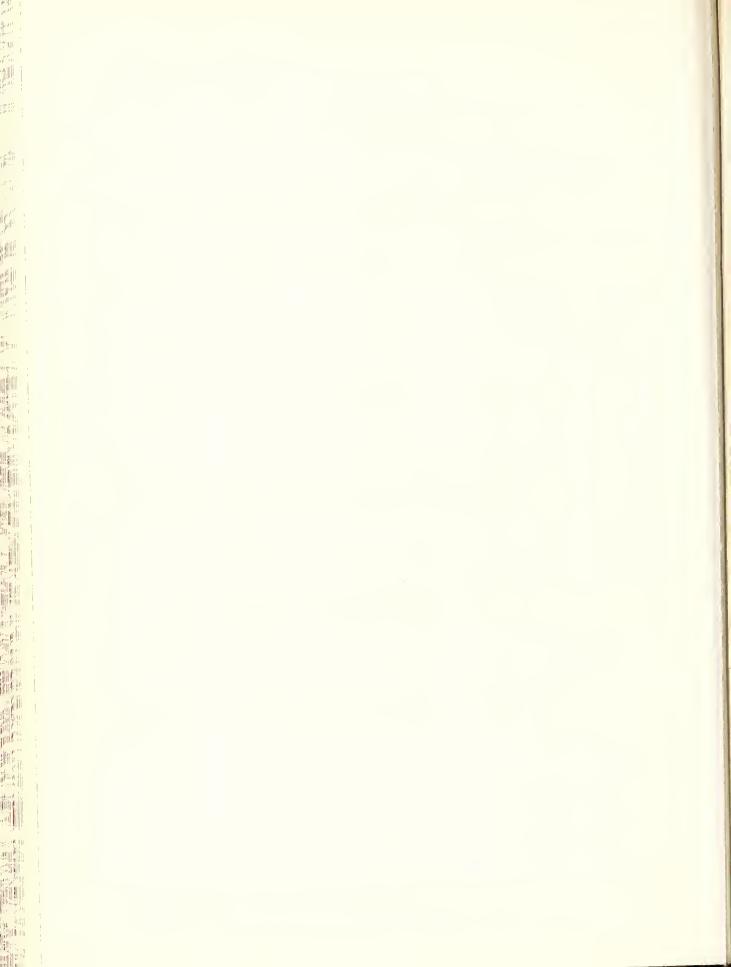
All of the area covered was within the limits of the Magee Ranger District. The data are representative of approximately 20,000 acres. The disease conditions were found to be so similar for all areas that no attempt will be made to describe them for each drainage in detail. The following table shows the general conditions on each area covered:

	Strip	Trees	Trees	Number	Per Cent	Cankers
Area	Miles	Examined	Infected	Cankers	Infection	Per 100 Trees
Jordan	19.3	13,329	13	13	0.10	0.10
Trail	10.2	7,990	37	41	0.46	0.51
East Fork	39.5	16,243	36	41	0.22	0.25
East Tepee	55.3	24,734	54	56	0.22	0.23
West Tepee	53.3	20,181	69	75	0.34	0.37
Van Hoosier	14.5	6,966	42	47	.0.60	0.67
Totals	192.1	89,443	251	273	0.28	0.30

# ORGANIZATION CHART



Total Number of Men on Blister Rust Work - 240



With the exception of Van Hoosier Creek, this is the first survey that has disclosed rust on any of these areas. A small infection center was found on Van Hoosier Creek in 1933, but this did not intensify, presumably because all cankers found were destroyed and because first ribes eradication was performed in 1935.

Control work was initiated in Tepee Creek in 1933 and has been carried on continuously since that time on some parts of the surveyed areas. The bulk of the area had been given first working by 1936, and all initial work has been completed now excepting on Trail Creek. Very little second work has been performed.

On Trail Creek the infection is of 1939 origin. On all other areas the infection became established in 1937 and 1938. Just why the disease was so slow in entering this vast area, is a matter for speculation. Now that it has become established, it will be a process of watchful waiting to see what its action will be. Where ribes are remaining, intensification should be quite rapid as this entire district is subjected to heavy ground fogs, starting early in the fall.

The disease survey, post check, and white pine stocking information was obtained at a total cost of \$2,942.86. Regular checking was performed at a total cost of \$1,381.05, or \$0.178 per acre.

### CANKER ELIMINATION

During February, March and April a 25-man CCC crew performed sanitation work in an 18 year old white pine stand in Scott Creek. This area, which formerly produced 80 M.B.M. white pine per acre, was badly infected and the trees were doomed unless energetic steps were taken to institute control. The work done consisted or removing all trees with trunk infection, pruning the lower crown of the remaining trees, and removing infected limbs above the portion pruned.

During March and April a 25-man CCC crew performed pruning work in Uranus Creek. This work consisted of pruning the dominant and codominant young white pine to a height of about eight feet and removing infected limbs above that point. This area had previously been worked once.

### STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the rollowing tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941

COEUR D'ALENE OPERATION

Cooperating Agency	Appropriation	Amount		
Forest Service	Regular	\$77,183.71		
Bureau of Entomology	Regular	2,737.49		
and	Idaho-ERA	354.69		
Plant Quarantine	Total	3,092.18		
All Agencies	Total	\$80,275.89		

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TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941

COEUR D'ALENE OPERATION

	Forest Service	Bureau			
T.			ant Quara		
Item	Regular	Regular	ERA	Total .	Total
Salaries, perm. men	\$ 1,430.00	\$2,737.49		\$2,737.49	\$ 4,167.49
Salaries, temp. men	13,513.99		\$ 25.55	25.55	13,539.54
Wages, temp. laborers	49,427.26		92.29	92.29	49,519.55
Subsistence supplies	9,863.77				9,863.77
Equipment	411.41				411.41
Travel and transp.	783.89		204.05	204.05	987.94
Other supplies	1,753.39		32.80	32.80	1,786.19
Total	\$77,183.71	\$2,737.49	\$354.69	\$3,092.18	\$30,275.89

TABLE 2A

# DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS COEUR D'ALENE OPERATION

Program	Number of Effective Man-Days		nditures ng to Fund	Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 2,737.49	
FS-Reg.	8,386	FS-Reg.	74,040.85	\$ 8.83
CCC	1,289	FS-Reg.	200.00	CCC Funds Not Included
		FS-Reg.	2,942.86	
Pine Disease Survey	231	EQ-ERA	354.69	14.28
and Post Check		Total	3,297.55	
Total Cost of 1941 Prog	ram		\$80,275.89	

	Forest Service
	Regular
Number of meals served	47,504
Average cost per meal	\$0.208
Pounds of twine used	1,600



### SUMMARY OF RIBES ERADICATION, 1941 COEUR D'ALENE OPERATION

### TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type		Acres Second Working	Acres Third Working		Effective Man-Days	Total Ribes	Per	Remaining r Acre Live Stem
Open Reproduction	2,881	3,420	241	6,542	7,739	1,132,907	5.7	12.2
Open Pole	66			66	10	2,002		
Open Mature		47		47	27	5,382		
Cutover	208	297		505	898	178,443	4.4	6.9
Burn		348		348	751	233,398	25.6	29.8
All Upland	3,155	4,112	241	7,508	9,425	1,552,132	6.0	12.2
Stream (Hand)	80	179		259	475	97,893	9.2	14.4
All Types	3,235	4,291	241	7,767	9,900	1,650,025	6.5	12.5

### TABLE 3A - FIRST WORKING

						Ribes 1	Ribes Remaining	
		Effective	Total	Per Acre	Basis	I	r Acre	
Eradication Type	Acres	Man-Days	Ribes	Man-Days	Ribes	Bushes	Live Stem	
Open Reproduction	2,881	4,302	899,503	1.49	312	7.7	17.8	
Open Pole	66	10	2,002	.15	30			
Cutover	208	569	108,776	2.74	523	5.0	7.8	
All Upland	3,155	4,881	1,010,281	1.55	320	7.5	17.2	
Stream (Hand)	80	144	33,988	1,80	425	17.6	26.9	
All Types	3,235	5,025	1,044,269	1.55	323	8.7	18.3	
		TABLE 3B	- SECOND W	ORKING				
Open Reproduction	3,420	3,132	220,605	.92	65	3.8	7.2	
Open Mature	47	27	5,382	. 57	115			
Cutover	297	329	69,667	1.11	235	3.7	5.9	
Burn	348	751	233,398	2.16	671	25.6	29.8	
All Upland	4,112	4,239	529,052	1.03	129	4.7	8.0	
Stream (Hand)	179	331	63,905	1.85	357	5.1	8.5	
All Types	4,291	4,570	592,957	1.07	138	4.8	8.1	
		TABLE 3C -	- THIRD WO	RKING				
Open Reproduction	241	305	12,799	1.27	53	4.8	5.4	



TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man-Days		Per Acre		Per	Remaining r Acre Live Stem
	FS-Reg.	3,133	4,603	1,027,462	1.47	328	7.7	17.8
First	F-CCC	102	422	16,807	4.14	165		
	Total	3,235	5,025	1,044,269	1.55	323	7.7	17.8
	FS-Reg.	3,899	3,703	557,945	.95	143	4.8	7.8
Second	F-CCC	392	867	35,012	2.21	89	4.7	10.3
	Total	4,291	4,570	592,957	1.07	138	4.8	8.1
Third	FS-Reg.	241	305	12,799	1.27	53	4.8	5.4
All	FS-Reg.	7,273	8,611	1,598,206	1.18	220	6.6	12.6
Workings	F-CCC	494	1,289	51,819	2.61	105	4.7	10.3
WOIKINGS	Total	7,767	9,900	1,650,025	1.27	212	6.5	12.5

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941

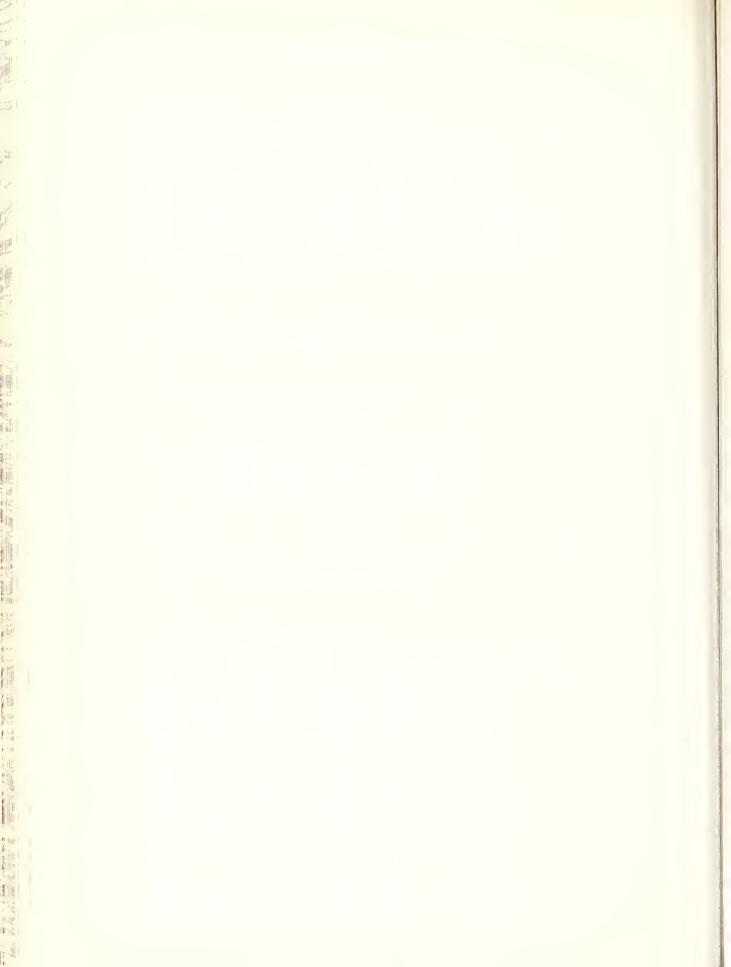
COEUR D'ALENE OPERATION

		Number of A By Forest		
State	Working	Forest Service	Private	Total
	First	3,087	148	3,235
T3.1.	Second	4,053	238	4,291
Idaho	Third	173	68	241
	Total	7,313	454	7,767

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
COEUR D'ALENE OPERATION

			r			1
			Ril	Ribes by Species		
	•	1	Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum	inerme	Ribes
	Open Reproduction	2,881	725,223	173,947	333	899,503
	Open Pole	66	105	1,897		2,002
First	Cutover	208	108,642	134		108,776
11130	All Upland	3,155	833,970	175,978	333	1,010,281
	Stream	80	11,823		22,165	33,988
	All Types	3,235	845,793	175,978	22,498	1,044,269
	Open Reproduction	3,420	127,392	93,213		220,605
	Open Mature	47	5,376	6		5,382
	Cutover	297	65,022	4,645		69,667
Second	Burn	348	175,977	57,421		233,398
	All Upland	4,112	373,767	155,285		529,052
	Stream	179	60,483	609	2,813	63,905
	All Types	4,291	434,250	155,894	2,813	592,957
Third	Open Reproduction	241	10,153	2,646		12,799
	Open Reproduction	6,542	862,768	269,806	333	1,132,907
	Open Pole	66	105	1,897		2,002
	Open Mature	47	5,376	6		5,382
All	Cutover	505	173,664	4,779		178,443
Workings	Burn	348	175,977	57,421		233,398
	All Upland	7,508	1,217,890	333,909	333	1,552,132
	Stream	259	72,306	609	24,978	97,893
	All Types	7,767	1,290,196	334,518	25,311	1,650,025



### SUMMARY OF RIBES ERADICATION, 1927-1941 COEUR D'ALENE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

	Acree	Acres	Acree			
	First	Second	Third	Total	Effective	Total
Eradication Type	Working	Working	Working	Acree	Man-Days	Ribee
Open Reproduction	70,930	13,698	1,860	86,488	147,542	20,507,587
Dense Reproduction	11,832	1,365	19	13,216	12,323	1,206,154
Open Pole	49,593	4,853	658	55,104	31,206	4,546,980
Dense Pole	16,439		167	17,535	4,884	696,469
Open Mature	128,834	10,242	1,826	140,902	95,747	15,196,004
Denee Mature	13,023	651		13,674	2,100	261,153
Cutover	11,873	7,329	3,961	23,163	33,524	6,816,716
Brueh	10,555	507		11,062	15,717	2,332,028
Burn	5,619	399		6,018	4,489	1,134,268
Subalpine	485			485	283	76,762
Meadow-Field	157			157		
All Upland	319,340	39,973	8,491	367,804	347,815	52,774,121
Stream (Hand)	13,204	4,429	1,181	18,814	59,270	12,313,781
Stream (Slash)	78	13		91	1,792	68,731
Stream (Machine)	1,045	87		1,132	5,038	566,000
Stream (Zone)	208	2,477		2,685	2,139	227,333
All Stream	14,535	7,006	1,181	22,722	68,239	13,175,845
All Typee	333,875	46,979	9,672	390,526	416,054	65,949,966

TABLE 7A - FIRST WORKING

		Effective	Total	Per Acre	Begig					
The state of the s										
Eradication Type	Acres	Man-Days	Ribes	Man-Daye	Ribee					
Open Reproduction	70,930	121,639	18,599,395	1.71	262					
Dense Reproduction	11,832	10,586	1,075,972	.89	91					
Open Pole	49,593	27,221	3,902,221	.55	79					
Dense Pole	16,439	4,366	617,178	.27	38					
Open Mature	128,834	86,481	13,988,483	.67	109					
Dense Mature	13,023	1,761	222,188	.14	17					
					374					
Cutover	11,873	16,580	4,445,173	1.40						
Brueh	10,555	14,983	2,234,161	1.42	212					
Burn	5,619	3,509	753,959	.62	134					
Subalpine	485	283	76,762	. 58	158					
Meadow-Field	157									
All Upland	319,340	287,409	45,915,492	.90	144					
Stream (Hand)	13,204	48,747	10,965,233	3.69	830					
Stream (Slash)	78	1,340	64,934		832					
Stream (Machine)	1,045		522,500	4.42	500					
Stream (Zone)	208	270	55,658	1.30	268					
All Stream	14,535	54,973	11,608,325	3.78	799					
All Types	333,875	342,382	57,523,817	1.03	172					
All Types	303,073	342,302	37,323,017	1.03	1/6					
Open Reproduction	13,698	22,610	1,709,917	1.65	125					
Dense Reproduction	1,365		129,662	1.25	95					
Open Pole	4,853		537,207	.69	111					
Denee Pole	929		73,713		79					
Open Mature	10,242		1,097,631		107					
Denee Mature	651	339	38,965		60					
Cutover	7,329	11,048	1,821,123		248					
Brush	507	734	97,867	1.45	193					
Burn	399		380,309	2.46	953					
All Upland	39,973	49,500	5,886,394	1.24	147					
				2.07	283					
Stream (Hand)	4,429	9,154	1,253,205	34.77	292					
Stream (Slach)	13	-	3,794							
Stream (Machine)	87	422	43,500		500					
Stream (Zone)	2,477	1,869	171,675		69					
All Stream	7,006	11,897	1,472,174		210					
All Typee	46,979	61,397	7,358,568	1.31	157					
TABLE 7C - THIRD WORKING										
	TABLE 7	C - THIRD	NORKING							
Open Reproduction			NORKING	1.77	107					
	1,860				107					
Dense Reproduction	1,860	3,293	198,275 520	1.26						
Dense Reproduction Open Pole	1,860 19 658	3,293 24 650	198,275 520 107,552	1.26	27 163					
Dense Reproduction Open Pole Dense Pole	1,860 19 658 167	3,293 24 650 94	198,275 520 107,552 5,578	1.26 .99 .56	27 163 33					
Dense Reproduction Open Pole Dense Pole Open Mature	1,860 19 658 167 1,826	3,293 24 650 94 949	198,275 520 107,552 5,578 109,890	1.26 .99 .56	27 163 33 60					
Dense Reproduction Open Pole Denee Pole Open Mature Cutover	1,860 19 658 167 1,826 3,961	3,293 24 650 94 949 5,896	198,275 520 107,552 5,578 109,890 550,420	1.26 .99 .56 .52 1.49	27 163 33 60 139					
Dense Reproduction Open Pole Dense Pole Open Mature Cutover All Upland	1,860 19 658 167 1,826 3,961 8,491	3,293 24 650 94 949 5,896	198,275 520 107,552 5,578 109,890 550,420 972,235	1.26 .99 .56 .52 1.49	27 163 33 60 139 115					
Dense Reproduction Open Pole Denee Pole Open Mature Cutover	1,860 19 658 167 1,826 3,961	3,293 24 650 94 949 5,896	198,275 520 107,552 5,578 109,890 550,420	1.26 .99 .56 .52 1.49	27 163 33 60 139					

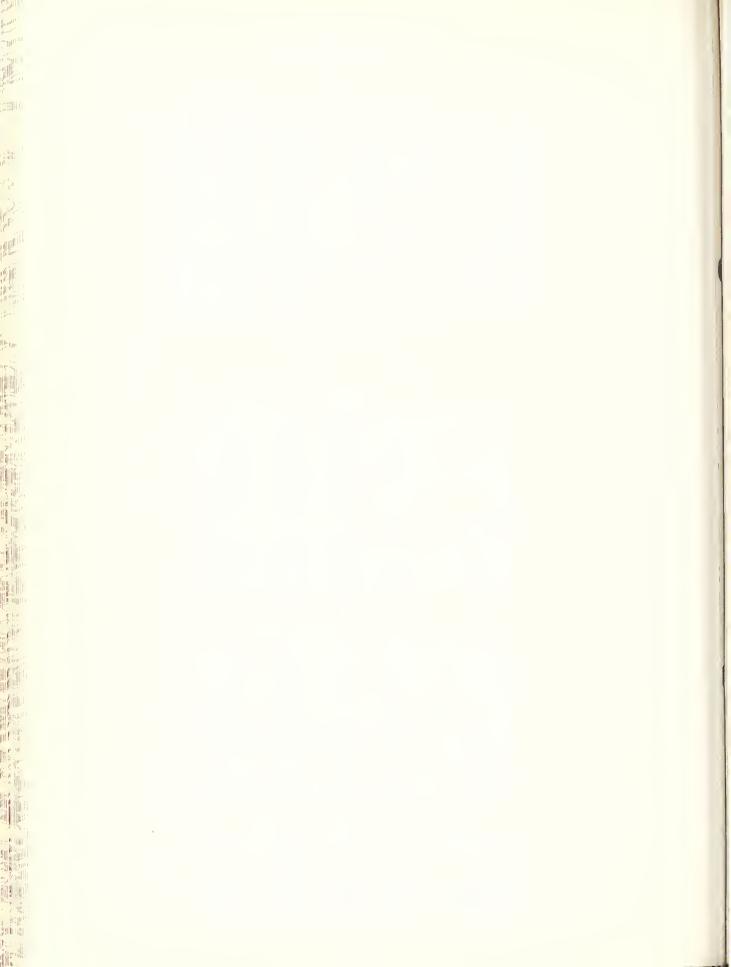


TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1941
COEUR D'ALENE OPERATION

			Effective	Total	Per Acre	
Working	Class	Acres	Man-Days	Ribes	Man-Days	Ribes
	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	39,271	41,592	8,371,437	1.06	213
	FS-NIRA	86,083	59,504	13,399,102	.69	156
First	EQ-ERA	40,997	35,497	6,584,066	.87	161
	FS-ERA	16,005	19,408	3,063,881	1.21	191
	F-CCC	125,743	178,030	23,258,948	1.42	185
	Total	333,875	342,382	57,523,817	1.03	172
	FS-Reg.	19,354	19,150	3,749,307	.99	194
	FS-NIRA	5,300	2,869	498,629	.54	94
Cossed	EQ-ERA	42	44	5,151	1.05	123
Second	FS-ERA	3,836	4,866	634,163	1.27	165
	F-CCC	18,447	34,468	2,471,318	1.87	134
	Total	46,979	61,397	7,358,568	1.31	157
	FS-Reg.	5,104	4,521	627,990	.89	123
fm) - 4 4	FS-ERA	487	250	24,398	.51	50
Third	F-CCC	4,081	7,504	415,193	1.84	102
	Total	9,672	12,275	1,067,581	1.27	110
	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	63,729	65,263	12,748,734	1.02	200
All	FS-NIRA	91,383	62,373	13,897,731	. 68	152
	EQ-ERA	41,039	35,541	6,589,217	.87	161
Workings	FS-ERA	20,328	24,524	3,722,442	1.21	183
	F-CCC	148,271	220,002	26,145,459	1,48	176
	Total	390,526	416,054	65,949,966	1.07	169

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1941

COEUR D'ALENE OPERATION

	Number of			
Working	Forest Service	State - Idaho	Private	Total
First	313,066	5,659	15,150	333,875
Second	43,506	530	2,943	46,979
Third	8,579	200	893	9,672
All				
Workings	365,151	6,389	18,986	390,526

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1941
COEUR D'ALENE OPERATION

	Num	per of Ac	res	Acres Mature Stands on Which Working	Total Acres
Ownership Class	Worked	Unworked	Total	Is Deferred	White Pine
Forest Service	313,066	34,636	347,702	10,303	358,005
Public Domain		2,110	2,110		2,110
Subtotal Federal	313,066	36,746	349,812	10,303	360,115
State - Idaho	5,659	1,171	6,830		6,830
Private	15,150	8,349	23,499	5,151	28,650
Total	333,875	46,266	380,141	15,454	395,595

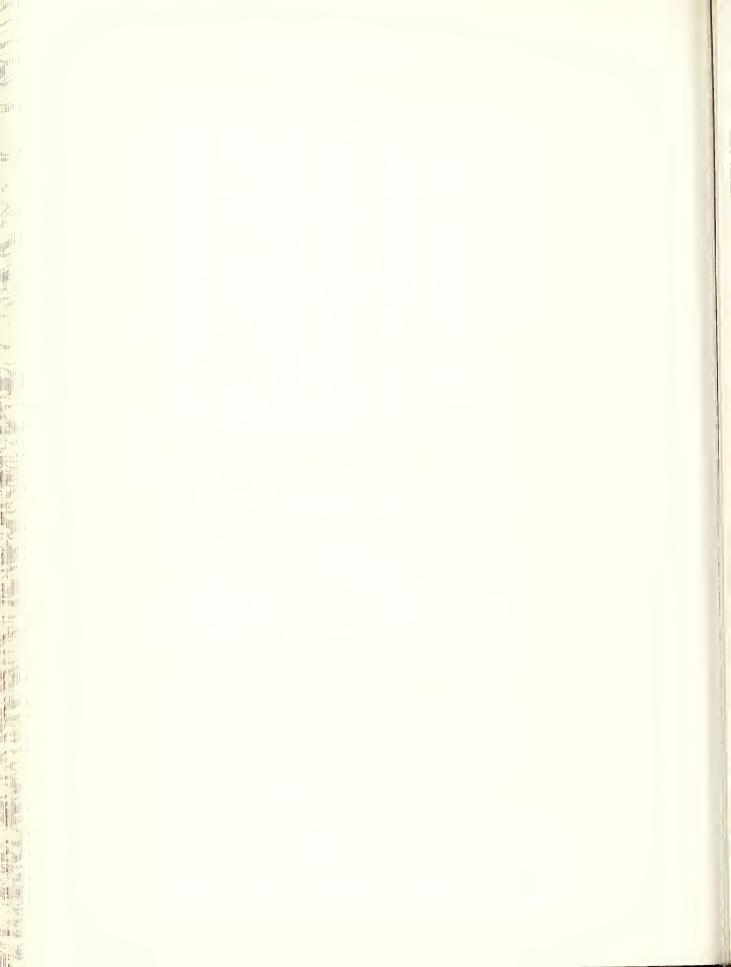
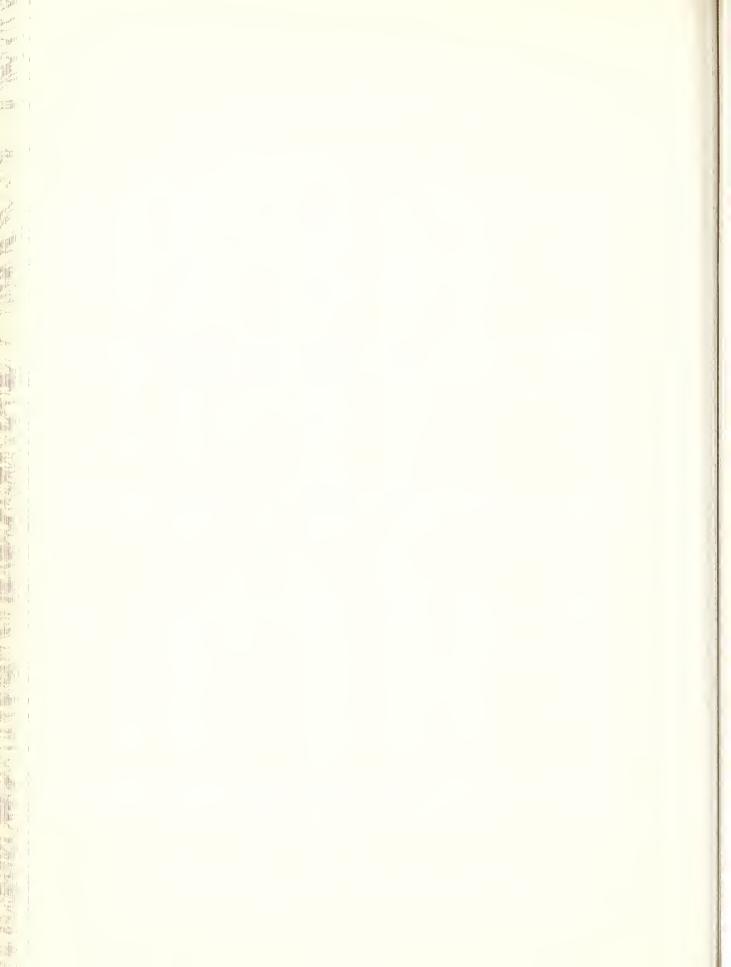


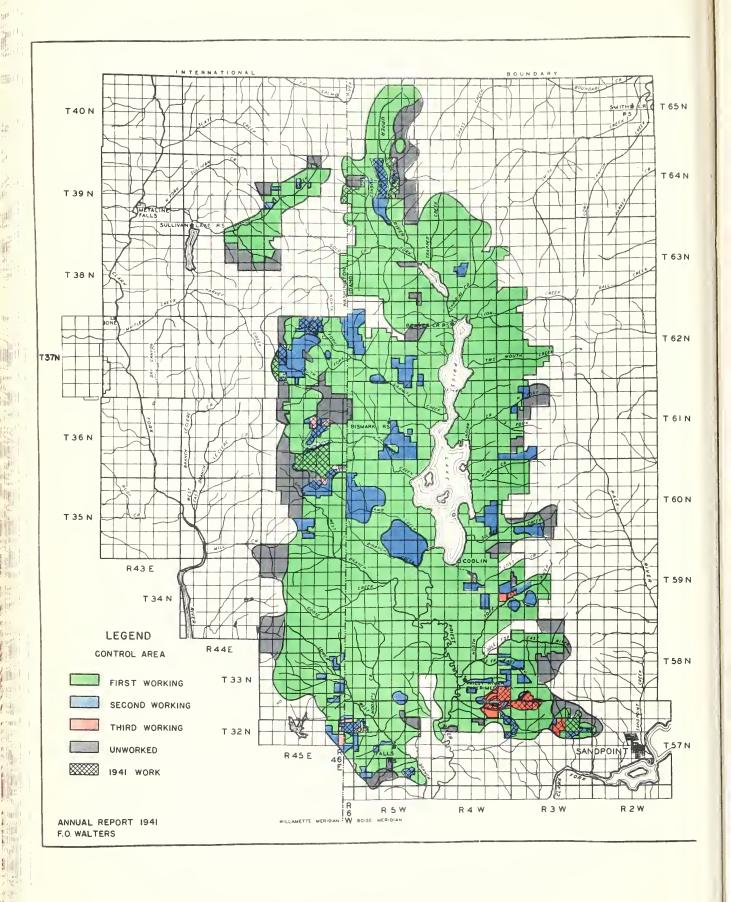
TABLE 11

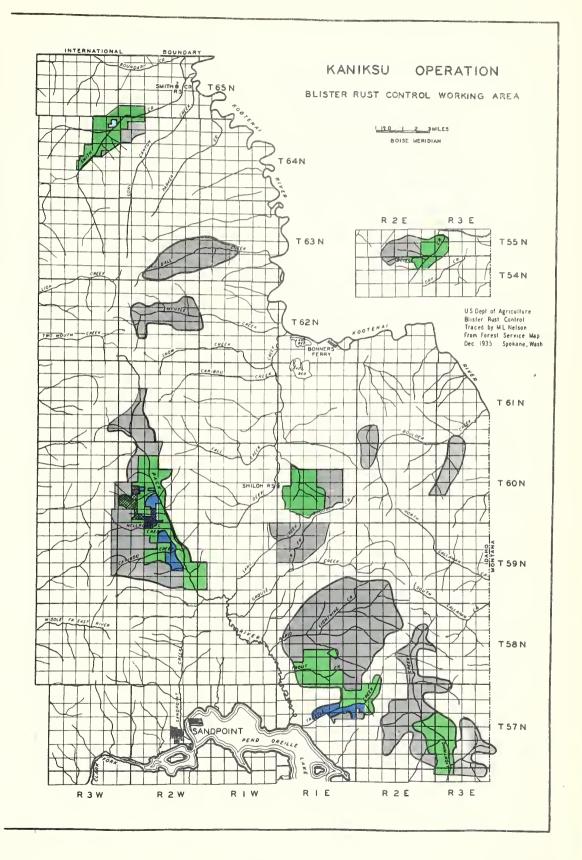
TOTAL RIBES BY SPECIES ERADICATED, 1927-1941
COEUR D'ALENE OPERATION

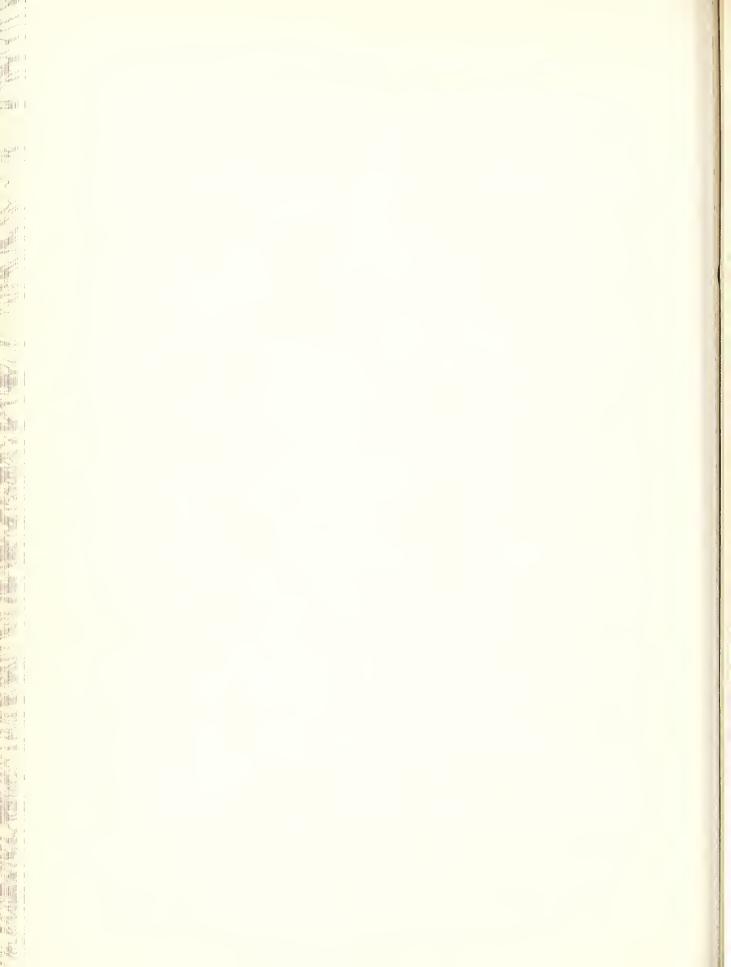
				Ribes				
			Ribes	Ribes	Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum		1	irriguum	Ribes
	Open Reproduction		11,045,512	6,953,597	2,227	499,256	98,803	18,599,395
	Dense Reproduction	11,832	665,227	402,844		5,323	2,578	1,075,972
	Open Pole	49,593	2,194,181	1,644,660	12,246	9,082	42,052	3,902,221
	Dense Pole	16,439	456,946	155,203		3,741	1,288	617,178
	Open Mature	128,834	10,859,965	2,899,230	1	79,624	149,663	13,988,483
	Dense Mature	13,023	193,735	17,816		9,778	859	222,188
	Cutover	11,873	3,048,678	1,351,373	1	17,536	27,585	4,445,173
First	Brush	10,555	778,322	1,424,834		25,748	5,257	2,234,161
	Burn	5,619	344,681	390,324		13,530	5,424	753,959
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	319,340	29,642,808	15,261,082	14,475	663,618	333,509	45,915,492
l	Stream	14,535	7,107,297	182,129	31,474	4,219,038		11,608,325
	All Types		36,750,105	15,443,211	45,949	4,882,656		57,523,817
	Open Reproduction	13,698	880,720	807,638	20,100	12,807	8,752	
	Dense Reproduction	1,365	102,536	27,032		11	83	129,662
	Open Pole	4,853	424,818	103,206	4,736	3,882	565	537,207
	Dense Pole	929	52,890	20,823	4,700	0,002	505	73,713
1	Open Mature	10,242	781,912	300,518		11,089	4,112	1,097,631
	Dense Mature	651	37,723	1,017		11,000	225	38,965
Second	Cutover	7,329	1,401,680	402,933		13,430	3,080	
	Brush	507				13,430	3,000	1,821,123
	Burn	399	11,517	86,350				97,867
	All Upland	39,973	262,454	117,855	4 556	41 610	3.0.03.0	380,309
	Stream	7,006	3,956,250	1,867,372	4,736	41,219	16,817	5,886,394
			1,026,507	43,277	4 556	396,389	6,001	
	All Types	46,979	4,982,757	1,910,649	4,736	437,608	22,818	
	Open Reproduction	1,860	128,980	68,228		1,067		198,275
ļ	Dense Reproduction	19.	520	10 505				520
	Open Pole	658	96,829	10,723				107,552
	Dense Pole	167	5,578					5,578
Third	Open Mature	1,826	95,320	14,570				109,890
	Cutover	3,961	471,005	79,415				550,420
	All Upland	8,491	798,232	172,936		1,067		972,235
	Stream	1,181	67,556	113		27,677		95,346
	All Types	9,672	865,788	173,049		28,744		1,067,581
	Open Reproduction		12,055,212	7,829,463	2,227	513,130		20,507,587
	Dense Reproduction	13,216	768,283	429,876		5,334	2,661	1,206,154
	Open Pole	55,104	2,715,828	1,758,589	16,982	12,964	42,617	4,546,980
	Dense Pole	17,535	515,414	176,026		3,741	1,288	696,469
	Open Mature		11,737,197	3,214,318	111	90,713		15,196,004
	Dense Mature	13,674	231,458	18,833		9,778	1,084	261,153
All	Cutover	23,163	4,921,363	1,833,721	1	30,966	30,665	6,816,716
Workings		11,062	789,839	1,511,184		25,748	5,257	2,332,028
	Burn	6,018	607,135	508,179		13,530	5,424	1,134,268
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	367,804	34,397,290	17,301,390	19,211	705,904	350,326	52,774,121
	Stream	22,722	8,201,360	225,519	31,474	4,643,104		13,175,845
	All Types		42,598,650	17,526,909	50,685	5,349,008		65,949,966
		1-00,000	,	1.,020,000	50,000	-,010,000	1~1,117	55,515,500











### BLISTER RUST CONTROL WORK, KANIKSU OPERATION, 1941 By

Frank O. Walters, Associate Pathologist
Kermit Miller, Assistant Pathologist, U. S. Forest Service
Harold A. Brischle, Assistant Pathologist

### INTRODUCTION

The Kaniksu operation includes the lands of the Kaniksu National Forest and the Priest Lake Timber Protective Association. The Forest Service program consisted of six camps of 33 men each financed by regular appropriations. The Bureau of Entomology and Plant Quarantine program on state and private lands included an ERA project under which 25 to 75 men were hauled from Sandpoint and 25 men from Priest River. An additional camp of 60 men was financed on a cooperative basis between the federal government, state of Idaho and the Priest Lake Timber Protective Association.

The annual fall blister rust control conference conducted by the Bureau of Entomology and Plant Quarantine was held October 20 to 23 at Kalispell Bay headquarters. The meeting was attended by 45 persons including all of the field personnel of the Spokane Blister Rust Control Office and 11 representatives from the California Blister Rust Control Office, the Division of Plant Disease Control, Washington, D. C., the U. S. Forest Service in Region One, the Northern Rocky Mountain Forest and Range Experiment Station and the Idaho School of Forestry. Field trips were taken each day to inspect and study various phases of timber management, tree planting and direct seeding practices, blister rust control work and blister rust canker elimination. Two evening meetings were held at which papers were given on the field application of ribes checking data and a proposed ribes regeneration key.

### ORGANIZATION AND ADMINISTRATION

Administrative headquarters for the Forest Service and the Bureau were located at Kalispell Bay. Subsistence supplies and equipment for the individual camps were dispatched from headquarters with trucks and pack stock being used to make deliveries. The accompanying organization chart shows the division of responsibility on the operation.

The first camp opened April 20, the last one June 24. Eradication work continued until late September, after which canker elimination work was carried on by the ERA crews.

Unfavorable weather conditions were a severe handicap to the efficient operation of this year's program. A shortage of men in the camps, loss of time due to rain and the necessity of increasing the pay rate contributed to an increased man-day cost.

### LOCATION AND DESCRIPTION OF AREAS

The regular Forest Service camps were located in the South Fork of Granite Creek, Tillicum Creek, Upper Priest River, Bench Creek, Tunnel Creek, Jeru Creek and Kalispell Creek. The Bureau camps were operated in Big Creek, Fox Creek, the Baldy area and Pack River. The cooperative camp was located in Big Creek.

The South Fork of Granite, Jeru and Bench Creeks, and parts of Big Creek, presented difficult eradication problems. Other areas represented medium to light working conditions.

Recently 10,780 acres have been returned to the National Forest by the Northern Pacific. This gives the Forest Service solid ownership in the South Fork of Granite Creek area where considerable eradication work has been carried on.

### METHODS AND EQUIPMENT

In general, standard methods and equipment were used. One-man crews were given a thorough tryout on what was considered a suitable area but the practice was soon abandoned due to the lowered efficiency of this method. Two-man crews were used successfully, but not extensively. Flanking crews covered a considerable acreage in the Kalispell Creek drainage.

### CHECKING AND PINE DISEASE SURVEY

The regular checking activity on the Kaniksu operation during 1941 included pine disease survey work which in the past was handled as a separate project.

The checking of current season work still constitutes the major portion of the checking work on the operation. Since comparatively little initial eradication was done, only a limited amount of advance survey was conducted. Regular checking included one or more four per cent samples on practically all lands worked during the year. A total of 19,353 acres of first, second, third and fourth workings was checked at a cost of \$0.179 per acre.

One of the most important functions of checking is that which measures the effectiveness of ribes suppression several years after eradication work. Due to ecological conditions certain areas are especially favorable to the future germination of ribes seed. On such areas a post check is made several years after eradication to determine the extent and amount of ribes regeneration. By augmenting this post check with a pine disease survey, correlative data showing the effectiveness of ribes suppression and the spread of the rust are obtained. From future surveys it will be possible to calculate the rate of increase or decrease of infection for individual areas.

Post check and pine disease survey were made on areas totaling 8,835 acres at a cost of \$0.099 per acre. This survey was carried on in 12 separate drainages or areas where 82.2 miles of check strip were run. The summaries of these results by individual area are shown in the succeeding section.

# Frank O. Walters Technical Supervisor Forest Officer U.S. FOREST SERVICE 6-F.S.-Reg. Comps Kermit Miller ORGANIZATION CHART KANIKSU OPERATION 3-E.Q.-E.R.A. Comps BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE Technical Supervisor Fronk O. Wolters I - E.Q.- Coop. Comp Checking Supervisor Harold A. Brischle 1-F.S.-Reg. Pine Diseose Checker 1-F.S.-Reg. Checker Foreman 1-E.Q.-Coop. Checker I-E.Q.-E.R.A. Checker 5-F.S.-Reg. Checkers

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Number of Camps - 3 Number of Men - 60

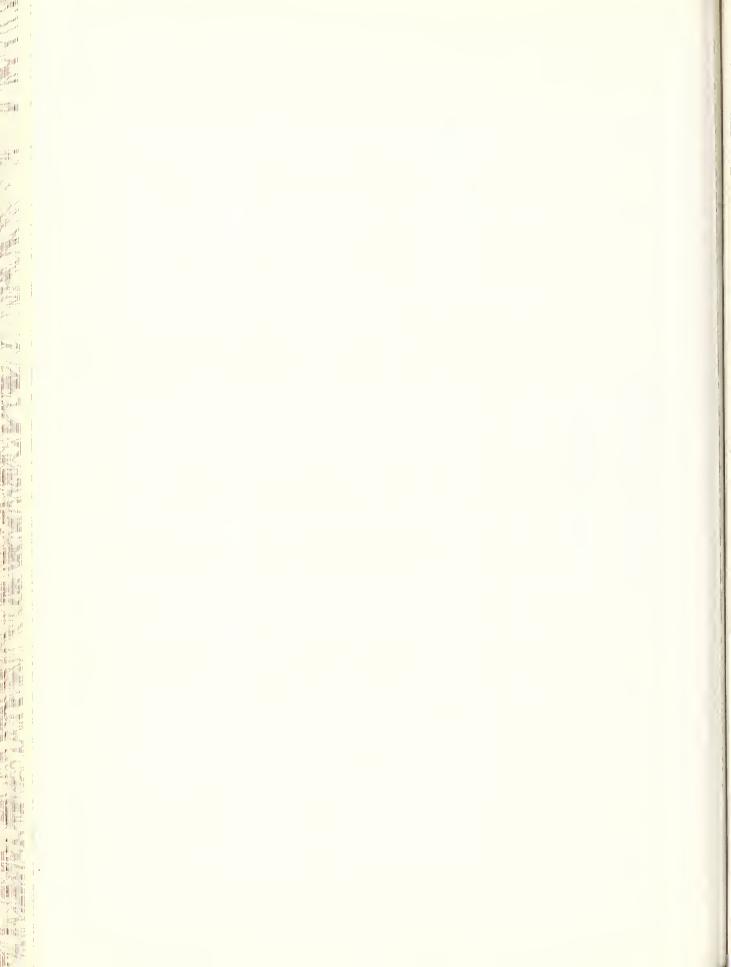
Number of Camps - 1 Number of Men - 50

E.Q.-COOP.

E.Q.-E.R.A.

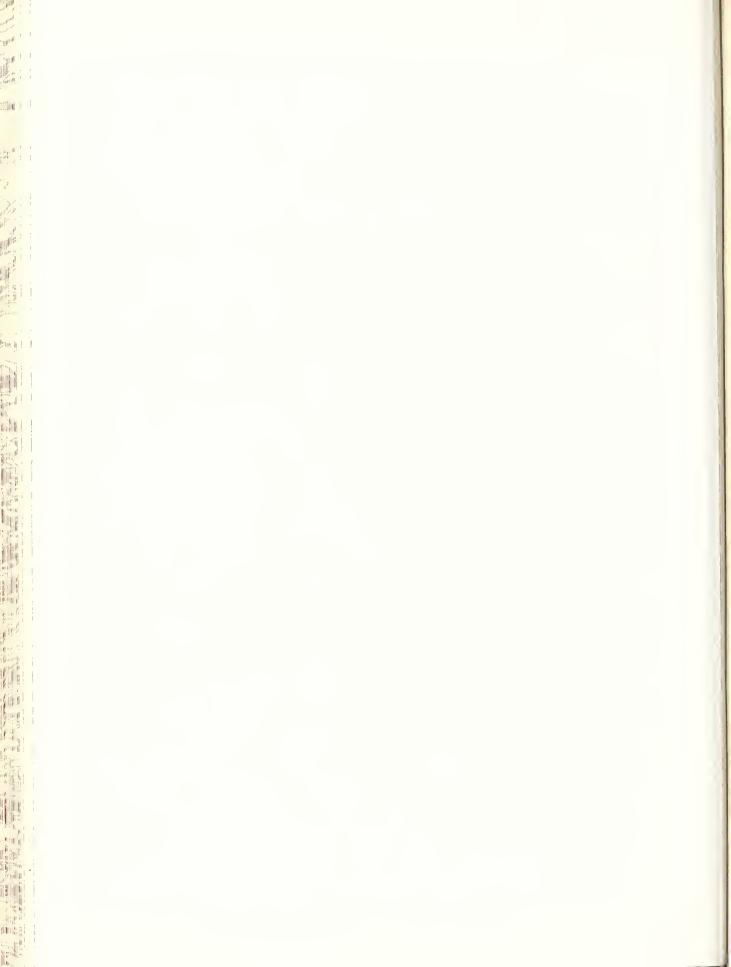
F. S.-REG. Number of Camps - 6 Number of Men - 176

Total Number of Men on Blister Rust Work - 286





White pine in Two Mouth Creek drainage, which is part of the extensive Idaho state-owned forest along the east side of Priest Lake. Much of the state land has been given protection from blister rust.



### 1. Cuban Hill Plantation, T. 57 N., R. 5 W., secs. 26, 35

Acres in area 360
Miles of survey strip 1.3
Number trees examined 1,582
Number trees infected 102
Per cent trees infected 6.4
Number cankers found 144

This planting was made in 1932 on an area burned over in 1931. Initial ribes eradication work was done early in the fall of 1938. The pine infection on most of the area is less than one per cent, but a heavy center on 30 acres increases the average for the entire area. The infection is largely of 1937 origin with a small amount of 1938 which apparently occurred before the ribes were removed in the fall of 1938.

The portions of the area having ribes concentrations were worked in 1941, and the final check shows one ribes and one foot of live stem per acre remaining on the area. In the fall of 1941 trees having trunk cankers were cut, and limb cankers were removed by pruning.

### 2. Lower West Branch, T. 57 N., R. 5 W., secs. 7, 8

Acres in area	500
Miles of survey strip	7.2
Number trees examined	3,361
Number trees infected	10
Per cent trees infected	0.3
Number cankers found	11

This area was cut over approximately 15 years ago. Some of the reproduction is approaching pole size. Initial ribes eradication work was done in 1934. The post check in 1936 indicated that the ribes population on most of the upland area was sufficiently low to place it in the maintenance classification. The 1941 pine disease survey verified this fact since the only ribes found were confined to the immediate vicinity of streams and seepages, where also a small amount of 1937 pine infection was found.

### 3. Gleason Meadows, T. 58 N., R. 5 W., secs. 3, 10

Acres in area	50
Miles of survey strip	.8
Number trees examined	804
Number trees infected	15
Per cent trees infected	2.0
Number cankers found	15

Areas in the vicinity of Gleason Meadows were given initial ribes eradication in 1934. No ribes were found on any of the survey strips in the upland and only an occasional bush was observed in the stream type. The infection found is all of 1937-1938 origin and was apparently introduced by the ribes in the stream type and along the edge of the meadows.

### 4. Upper West Branch, T. 59 N., R. 5 W., secs. 14, 15, 16, 17, 20, 21, 22, 23

Acres in area	1,400
Miles of survey strip	18.1
Number trees examined	11,315
Number trees infected	137
Per cent trees infected	1.2
Number cankers found	145

The pine disease survey in the Upper West Branch drainage was confined to areas cut over from 1928 to 1935 on which reproduction has become well established. Initial eradication work was done in 1934. The survey showed seven ribes and 50 feet of live stem per acre on the area. These ribes were found largely near streams and wet places with very few in the upland.

A high per cent of the cankers found were parasitized and have never fruited. The infection found is of 1937 and 1938 origin. There is still some regeneration of ribes on the more recently cutover areas, while on the older cutover areas germination has ceased.

### 5. Big Creek Drainage, T. 57 N., R. 3 W., secs. 5, 6

Acres in area	115
Miles of survey strip	1.3
Number trees examined	1,680
Number trees infected	833
Per cent trees infected	49.5
Number cankers found,	
(partial tally)	2,786

A large-scale logging operation was carried on in the Big Creek drainage from 1928 to 1934. Since 1934, numerous small white pine and cedar sales have been made, causing continued ground disturbance favorable to the germination of ribes seed.

Initial ribes eradication work was done prior to logging in 1928, and second and third eradication work was done in 1937, 1938 and 1941 over parts of the area. The reproduction of white pine has been heavy over most of the area, and the pine disease survey data indicate that the somewhat heavy infection took place in 1937 and 1938.

After the pine disease survey was completed, eradication crews covered sections 5 and 6. There are still numerous ribes seedlings which will necessitate additional eradication work.

From the above pine disease survey data it will be noted that the per cent of infected trees is quite high. A canker elimination project by limb removal was conducted on this area to save a good stocking of white pine.

### 6. Fox Creek Drainage, T. 57 N., R. 4 W., sec. 2; T. 58 N., R. 4 W., sec. 36

Acres in area	640
Miles of survey strip	3.6
Number trees examined	3,389
Number trees infected	126
Per cent trees infected	3.7
Number cankers found	397

Initial ribes eradication was done in the Fox Creek drainage in 1928 shortly before the area was cut over. Sufficient seed trees were left standing to insure the reproduction of white pine. The area was given a second eradication in 1937, and a third in 1939. During the 1941 field season portions of the area where the ribes population persisted were again worked. Prior to the 1941 eradication work a pine disease survey and post check were made on the area. At the present time there seems to be no new germination of ribes on the area; however, there are still some small bushes along the numerous old skid roads and log chutes as shown by the 1941 final check.

Infection on this area is generally distributed and occurred in 1937, 1938 and 1939.

### 7. Kalispell Bay, T. 60 N., R. 5 W., secs. 9, 12

Acres in area	240
Miles of survey strip	4.1
Number trees examined	5,222
Number trees infected	8
Per cent trees infected	0.3
Number cankers found	8

Areas in the vicinity of Kalispell Bay were burned over by a 1926 fire, the results of which caused numerous snags and down timber. This burn was so extensive that natural reseeding of white pine was questionable. Since the fire hazard was fairly high, the Forest Service deemed it advisable to fell all dead timber, control-burn and plant the area. This procedure was carried out, and portions of the area around Kalispell Bay were control-burned in the fall of 1935 and 1936 and planted the year following the respective burning. The control burning resulted in fires hot enough to destroy any ribes seed that may have been stored in the ground, and subsequent regeneration from seed has been confined almost entirely to the edges of several small streams. Initial ribes eradication work was done in 1934 before plans had been made for the snagging and control-burning program.

The pine disease survey indicates a very small amount of pine infection is present along with ribes to the extent of one bush and one foot of live stem per acre as determined by the survey. The pine infection found is all of 1937 and 1938 origin.

### 8. Tillicum Creek Drainage, T. 37 N., R. 45 E., sec. 3

Sport H

Acres III

Acres in area	160
Miles of survey strip	1.8
Number trees examined	3,165
Number trees infected	52
Per cent trees infècted	1.6
Number cankers found	58

Most of the Tillicum Creek drainage was included in the 1926 burn. White pine reproduction and the reproduction of ribes on the area have been heavy. Much dead and down timber and brush have made it a difficult area to work. Eradication crews covered portions of Tillicum Creek in 1934, 1939, 1940 and 1941. The 1941 pine disease survey was made on areas given initial eradication in 1934. After the 1941 disease survey was completed, the area was given a second working by eradication crews. A final check on the 1941 eradication work shows three ribes and seven feet of live stem per acre remaining on the upland area. The disease survey indicates that pine infection is generally distributed over the entire area and shows it to be largely of 1937 and 1938 origin.

### 9. Packer Creek, T. 62 N., R. 5 W., secs. 15, 16, 21, 22

Acres in area	800
Miles of survey strip	3.3
Number trees examined	2,567
Number trees infected	43
Per cent trees infected	1.6
Number cankers found	51

The areas on which the pine disease survey was made in Packer Creek were given initial eradication in 1936 and 1938. Infection found on the areas is light and of 1936, 1937 and 1938 origin. The survey showed three ribes and 20 feet of live stem per acre on the area.

## 10. Granite Mountain, T. 62 N., R. 5 W., secs. 25, 36; T. 61 N., R. 5 W., sec. 1

Acres in area	520
Miles of survey strip	4.8
Number trees examined	4,497
Number trees infected	320
Per cent trees infected	7.1
Number cankers found	369

The area surveyed in the vicinity of Granite Mountain was burned over in 1926. Since the fire there has been a heavy regeneration of white pine and ribes. Ribes eradication on the area has been difficult due to the large amount of down timber and brush. Initial eradication was performed on a part of the area in 1934. Additional first work and some second work were done in 1936 and 1939. Few ribes were found on the survey, indicating that a good job of second eradication was made in 1939. Initial pine infection

probably occurred on the area as early as 1933 with a heavy spread in 1936, 1937 and 1938.

### 11. South Fork of Granite Creek, T. 37 N., R. 45 E., secs. 19, 20, 21, 30

Year of Eradication -	1934-1940	Unworked
tomas in smos	1 700	3.60
Acres in area	1,300	160
Miles of survey strip	15.0	1.9
Number trees examined	13,474	11,672
Number trees infected	1,226	1,269
Per cent trees infected	9.1	10.9
Number cankers found	2,422	1,658

The control area in the South Fork of Granite Creek drainage comprises approximately 18 sections, almost all of which were in the 1926 fire. Initial ribes eradication was started in 1934, and both initial and second work were made in 1939, 1940 and 1941. All initial eradication within the control boundary was completed in 1941. The results of an effective job of ribes eradication in 1934 are in evidence since most of the rust found is in areas that were not worked until after the heavy 1937 wave of infection took place.

The survey shows that approximately 14 ribes per acre remain on the worked area. The live stem per acre is low since all ribes found are one foot or less in size.

### 12. Sema and Diamond Creek Drainages, T. 36 N., R. 46 E., sec. 6; T. 36 N., R. 45 E., secs. 1, 2, 3; T. 37 N., R. 45 E., secs. 35, 36

Year of Eradication	- 1934	1936	Unworked
Acres in area	420	60	2,050
Miles of survey strip	2.8	0.8	15.4
Number trees examined	3,331	362	7,958
Number trees infected	137	0	293
Per cent trees infected	4.1	0	3.7
Number cankers found	215	0	345

These drainages are within the 1926 burn area. Initial eradication was done in 1934 and 1936. Due to the very heavy ribes population, high fire hazard and severity of the rust, a portion of the Diamond Creek drainage has been snagged by the Forest Service and will be control-burned and planted. Most of the Diamond Creek area, however, was so severely burned in 1926, that few white pine or ribes have come back. This is the reason most of the drainage remains unworked.

### CANKER ELIMINATION

In certain well-stocked, rather heavily infected areas of white pine it was found to be reasonably practical to prevent heavy loss of the young pine by eliminating the cankers which had not yet reached the trunk of the tree.

In general, the lower third of the limbs was pruned off without inspecting for cankers. The remaining limbs were then inspected for infection before further cutting was performed. Additional inspections are made by more highly skilled individuals to improve the efficiency of the work. Although it is impossible to eliminate all infected limbs a very high per cent of the infected trees which otherwise would have been lost are saved by this treatment. During the period from late September to December 30, 2,104 acres were covered and 820,552 trees were treated with an expenditure of 1,959 man-days.

The bulk of this work was carried on in Big Creek. Other areas treated were Cuban Hill Plantation, Tunnel Creek and Lamb Creek.

### STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperating agency and the type of appropriation:

Man and a

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941

KANIKSU OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$ 66,375.81
	Regular	6,742.87
Bureau of Entomology	Regular-Coop.	2,082.52
and	Idaho-ERA	48,623.05
Plant Quarantine	WashERA	816.69
	Total	58,265.13
Idaho	State	2,038.46
PLTPA	Private	4,282.62
	Total	6,321.08
All Agencies	Total	\$130,962.02

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941

KANIKSU OPERATION

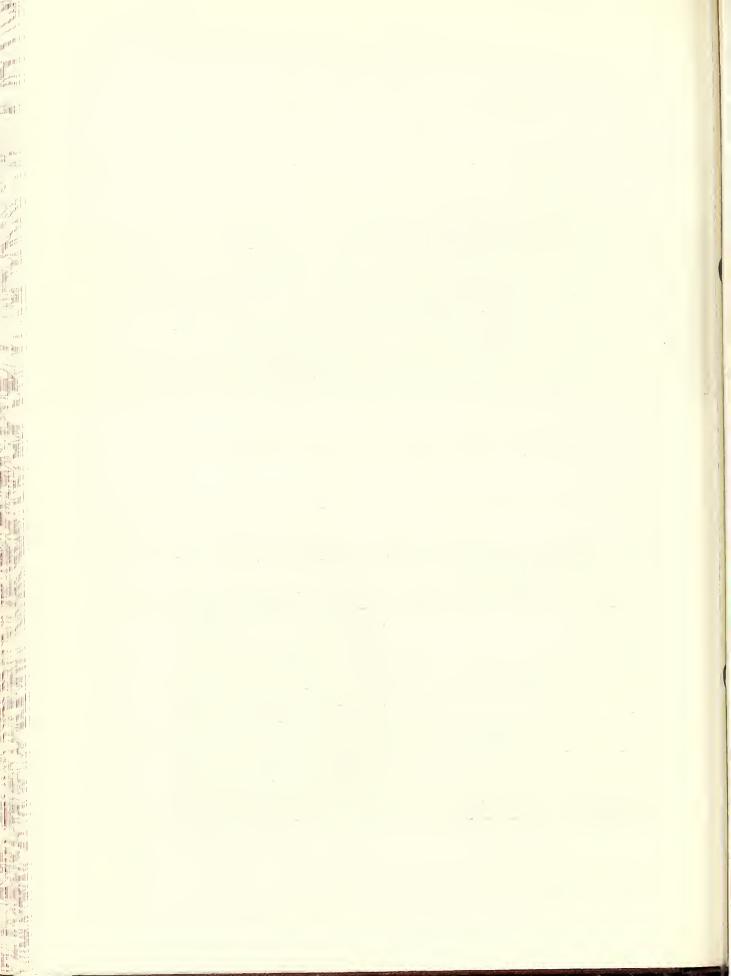
Forest	Bureau	of Entomole	ogy and	Contrib.	
Service	Pla	ant Quarant:	ine	Funds	
				Idaho	
Regular	Regular	ERA	Total	and CTPA	Total
\$ 1,283.29	\$4,900.00		\$ 4,900.00		\$ 6,183.29
8,926.02		\$ 5,841.42	5,841.42		14,767.44
39,789.78	497.00	37,331.12	37,828.12	\$6,321.08	83,938.98
10,670.29	2,225.32	2,711.01	4,936.33		15,606.62
2,157.59	173.11	100.69	273.80		2,431.39
891.67					891.67
410.65	474.35	1,824.29	2,298.64		2,709.29
1,629.18					1,629.18
617.34	555.61	1,631.21	2,186.82		2,804.16
\$66,375.81	\$8,825.39	\$49,439.74	\$58,265.13	\$6,321.08	\$130,962.02
	Regular \$ 1,283.29 8,926.02 39,789.78 10,670.29 2,157.59 891.67 410.65 1,629.18 617.34	Service       Plane         Regular       Regular         \$ 1,283.29       \$4,900.00         8,926.02       497.00         10,670.29       2,225.32         2,157.59       173.11         891.67       410.65       474.35         1,629.18       617.34       555.61	Service       Plant Quarant         Regular       ERA         \$ 1,283.29       \$4,900.00         8,926.02       \$5,841.42         39,789.78       497.00       37,331.12         10,670.29       2,225.32       2,711.01         2,157.59       173.11       100.69         891.67       410.65       474.35       1,824.29         1,629.18       617.34       555.61       1,631.21	Service         Plant Quarantine           Regular         ERA         Total           \$ 1,283.29         \$4,900.00         \$ 4,900.00           8,926.02         \$ 5,841.42         5,841.42           39,789.78         497.00         37,331.12         37,828.12           10,670.29         2,225.32         2,711.01         4,936.33           2,157.59         173.11         100.69         273.80           891.67         410.65         474.35         1,824.29         2,298.64           1,629.18         617.34         555.61         1,631.21         2,186.82	Service         Plant Quarantine         Funds           Regular         ERA         Total         and CTPA           \$ 1,283.29         \$4,900.00         \$ 4,900.00         and CTPA           \$ 1,283.29         \$4,900.00         \$ 5,841.42         5,841.42           39,789.78         497.00         37,331.12         37,828.12         \$6,321.08           10,670.29         2,225.32         2,711.01         4,936.33         and CTPA           2,157.59         173.11         100.69         273.80         and CTPA           891.67         and CTPA         and CTPA         and CTPA           410.65         474.35         1,824.29         2,298.64         and CTPA           1,629.18         and CTPA         and CTPA         and CTPA

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS
KANIKSU OPERATION

	Number of			Effective	
	Effective	Expend	itures	Man-Day	
Program	Man-Days	According	to Fund	Cost	
Planning, Coordination,					
and Technical Direction		EQ-Reg.	\$ 3,675.00		
FS-Reg.	6,996	FS-Reg.	65,121.15	\$9.32	
		Idaho	2,038.46		
		PLTPA	4,282.62	6.44	
Cooperative		EQ-Reg.	2,067.87		
		EQ-RegCoop.	2,082.52		
·		Total	10,471.47		
		EQ-ERA	39,970.80		
EQ-ERA	5,310	EQ-Reg.	1,000.00	7.71	
		Total	40,970.80		
Pine Disease Survey	111	FS-Reg.	974.66	8.78	
		FS-Reg.	280.00		
Canker Elimination	1,959	EQ-ERA	9,468.94	4.46	
		Total	9,748.94		
Total Cost of 1941 Progr	ram		\$130,962.02		

	Forest Service	Bureau
Number of meals served	39,012	26,520
Average cost per meal	\$0.2189	\$0.2132
Pounds of twine used	3,300	1,150



### SUMMARY OF RIBES ERADICATION, 1941 KANIKSU OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working			Effective Man-Days	Total Ribes	Pe:	Remaining r Acre Live Stem
Open Reproduction	5,159	6,256	3,869	15,284	11,059	2,110,316	4	4
Dense Reproduction		9	60	69	70	74,793	1	5
Open Pole	875	1,197		2,072	1,161	120,067	3	6
Dense Pole		367	10	377	58	1,840	1	2
Open Mature	567	368	76	1,011	318	35,856	2	3
Cutover	596	356	51	1,003	723	157,212	5	3
Brush			32	32	24	500	1	1
All Upland	7,197	8,553	4,098	19,848	13,413	2,500,584	4	4
Stream (Hand)	87	171	92	350	521	68,765	2	4
All Types	7,284	8,724	4,190	20,198	13,934	2,569,349		

TABLE 3A - FIRST WORKING

						Ribes	Remaining
		Effective	Total	Per Acre			r Acre
Eradication Type	Acres	Man-Days	Ribes	Man-Days	Ribes	Bushes	Live Stem
Open Reproduction	5,159	3,046	806,215	.59	156	2	3
Open Pole	875	841	95,288		109	2	4
Open Mature	567	141	16,513		29	1	3
Cutover	596	506	95,354		160	3	3
All Upland	7,197	4,534	1,013,370		141	2	3
Stream (Hand)	87	189	25,806		297	2	4
All Types	7,284	4,723	1,039,176	.65	143		
		TABLE 31	B - SECOND	WORKING			
Open Reproduction	6,256	3,689	715,164	.59	114	3	4
Dense Reproduction	9	1		.11		0	0
Open Pole	1,197	320	24,779	.27	21	2	6
Dense Pole	367	52	1,771	.14	5	1	1
Open Mature	368	127	18,409	.35	50	2	4
Cutover	356	172	52,152	.48	146	4	3
All Upland	8,553	4,361	812,275	.51	95	3	4
Stream (Hand)	171	235	36,824	1.37	215	2	3
All Types	8,724	4,596	849,099	.53	97		
		TABLE 30	C - THIRD W	VORKING			
Open Reproduction	3,869	4,324	588,937	1.12	152	8	4
Dense Reproduction	60	69	74,793	1.15	1,247	0	0
Dense Pole	10	6	69	.60	7	0	0
Open Mature	76	50	934	.66	12	0	0
Cutover	51	45	9,706	.88	190	2	2
Brush	32	24	500	. 75	16	0	0
All Upland	4,098	4,518	674,939	1.10	165	2	4
Stream (Hand)	92	97	6,135	1.05	67	1	1
All Types	4,190	4,615	681,074	1.10	163		

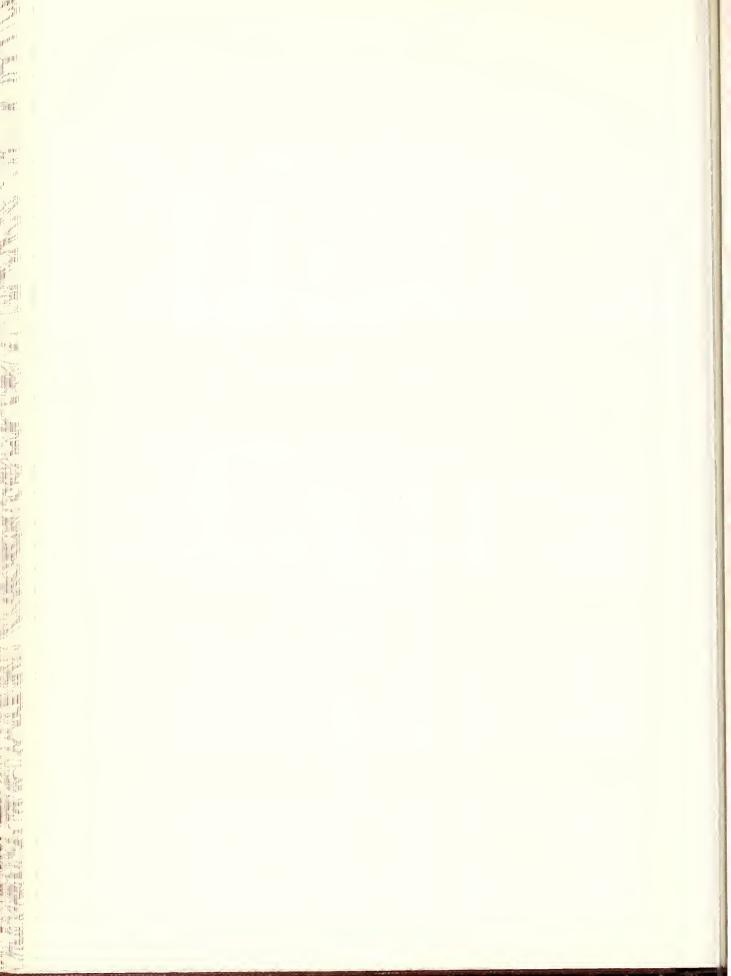


TABLE 4
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
KANIKSU OPERATION

				Effective	Total	Per Acre	Basis	1	Remaining Acre
State	Working	Class	Acres	Man-Days					Live Stem
		EQ-ERA	1,019	1,274	198,446	1.25	195		
	First	FS-Reg.	2,295		249,626		109		
		Total	3,314		448,072		135		
		EQ-ERA	1,130		65,656		58		
	C	FS-Reg.	2,602	891	76,649		29		
	Second	EQ-Coop.	739	376	63,703		86		
		Total	4,471	2,285	206,008	.51	46		
Idaho		EQ-ERA	2,294	3,018	244,875		107		
	m	FS-Reg.	209	129	17,944		86		
	Third	EQ-Coop.	1,054	1,252	342,990		325		
		Total	3,557	4,399	605,809		170		
		EQ-ERA	4,443	5,310	508,977		115		
	All	FS-Reg.	5,106	3,284	344,219		67		
	Workings	EQ-Coop.	1,793	1,628	406,693		227		
		Total	11,342	10,222	1,259,889		111		
	First	FS-Reg.	3,970	1,185	591,104		149		
	Second	FS-Reg.	4,253	2,311	643,091		151		
Washington		FS-Reg.	633	216	75,265		119		
	All								
	Workings	FS-Reg.	8,856	3,712	1,309,460	.42	148		
	-	EQ-ERA	1,019		198,446		195	4	6
	First	FS-Reg.	6,265		840,730		134	2	3
		Total	7,284	4,723	1,039,176	.65	143		
		EQ-ERA	1,130	1,018	65,656		58	3	8
	G	FS-Reg.	6,855	3,202	719,740	.47	105	3	4
	Second	EQ-Coop.	739	376	63,703	.51	86	6	3
Idaho		Total	8,724	4,596	849,099	.53	97		
and		EQ-ERA	2,294	3,018	244,875		107	4	4
Washington	ma a an a	FS-Reg.	842	345	93,209		111	2	4
Ü	Third	EQ-Coop.	1,054	1,252	342,990		325	20	2
		Total	4,190	4,615	681,074		163		
		EQ-ERA	4,443		508,977		115		
	All	FS-Reg.	13,962		1,653,679		118		
	Workings	EQ-Coop.	1,793	1,628	406,693	.91	227		
		Total	20,198		2,569,349		127	4	4

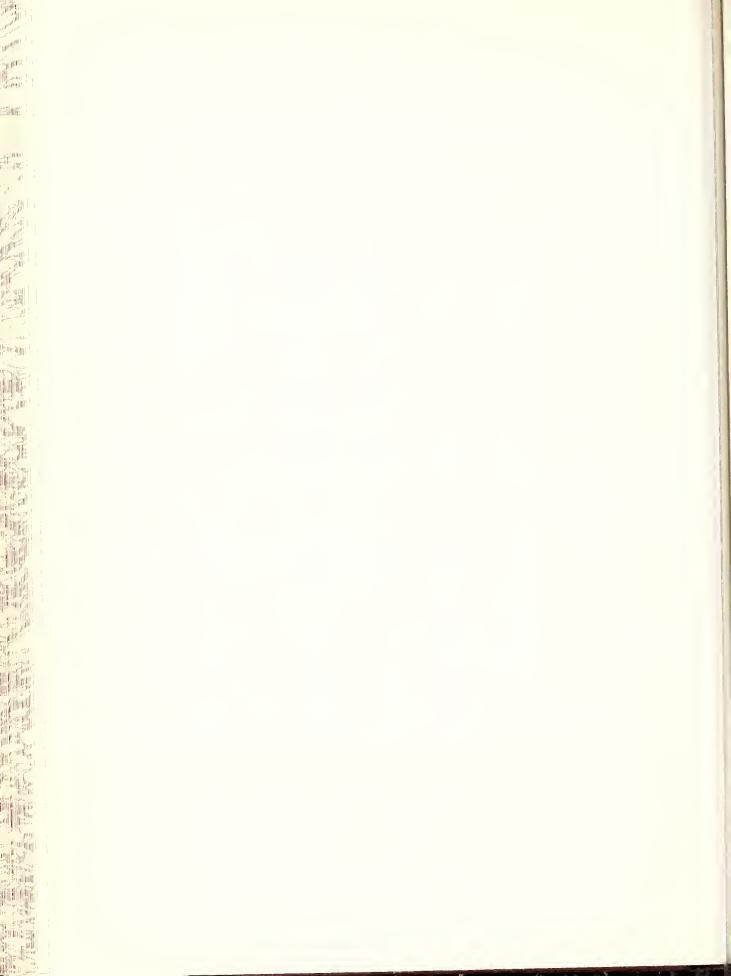


TABLE 5

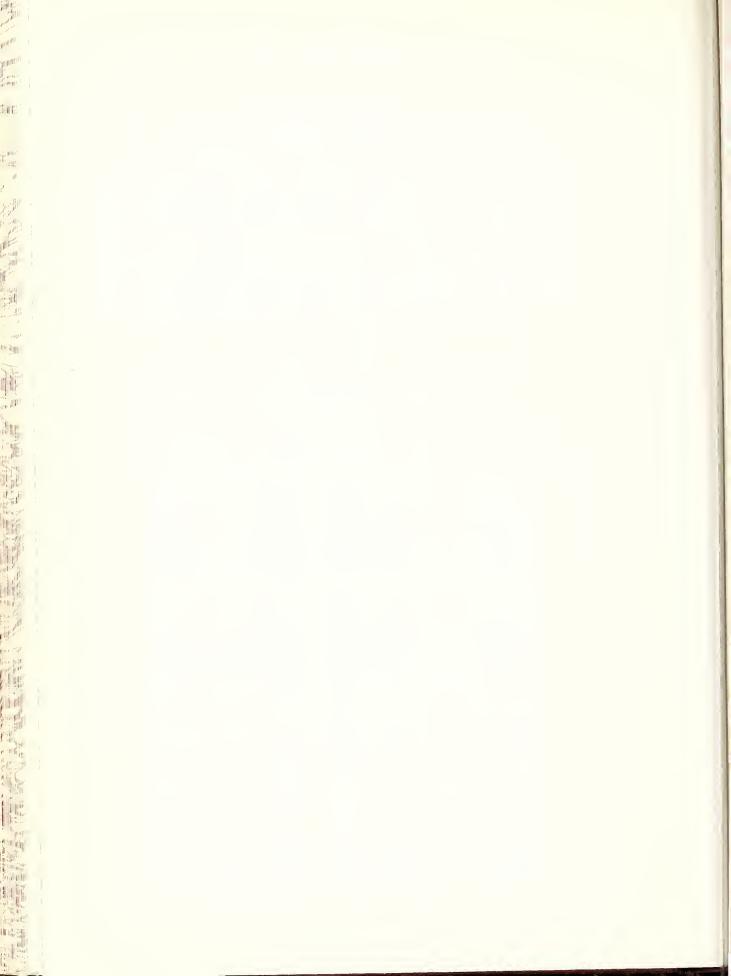
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
KANIKSU OPERATION

		Fore	B <b>y</b> est Se	rvice	Number o By Burea and Pla	u of En	tomology		Total		
State	Working	Forest Service	State	Private	Forest Service	State	Private	Forest Service	State	Private	Total
	First	2,155	60	80	230		789	2,385	60	869	3,314
Idaho	Second	2,506		107	589	811	458	3,095	811	565	4,471
Idano	Third	20		191		2,803	543	20	2,803	734	3,557
	Total	4,681	60	378	819	3,614	1,790	5,500	3,674	2,168	11,342
	First	3,970						3,970			3,970
Washington	Second	4,210		43				4,210		43	4,253
Manitugeon	Third	633						633			633
	Total	8,813		43				8,813		43	8,856
	First	6,125	60	80	230		789	6,355	60	869	7,284
Total	Second	6,716		150	589	811	458	7,305	811	608	8,724
TOTAL	Third	653		191		2,803	543	653	2,803	734	4,190
	Total	13,494	60	421	819	3,614	1,790	14,313	3,674	2,211	20,198

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
KANIKSU OPERATION

			Ribe	es by Species		
			Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum	inerme	Ribes
	Open Reproduction	5,159				806,215
	Open Pole	875	67,370	27,918		95,288
	Open Mature	567	9,913			16,513
First	Cutover	596	31,596	63,758		95,354
	All Upland	7,197	359,617	653,753		1,013,370
	Stream	87	21,574	4,232		25,806
	All Types	7,284	381,191	657,985		1,039,176
	Open Reproduction	6,256	187,408	523,033	4,723	715,164
	Dense Reproduction	9				
	Open Pole	1,197	12,632	11,697	450	24,779
	Dense Pole	367				1,77
Second	Open Mature	368	6,949	11,460		18,409
	Cutover	356	15,332		1,742	52,152
	All Upland	8,553	223,012		6,915	812,27
	Stream	171	25,051	3,507	8,266	36,824
	All Types	8,724		585,855	15,181	849,099
	Open Reproduction	3,869	159,387		915	588,93
	Dense Reproduction	60	1,305			74,793
	Dense Pole	10	23			69
	Open Mature	76	563	371	ĺ	934
Third	Cutover	51	4,025	680	5,001	9,706
	Brush	32	233			500
	All Upland	4,098	165,536	503,487	5,916	674,939
	Stream	92	4,763		199	
	All Types	4,190	170,299		6,115	681,074
	Open Reproduction	15,284				2,110,316
	Dense Reproduction	69			,	74,79
	Open Pole	2,072			450	120,06
	Dense Pole	377				1,840
All	Open Mature	1,011				35,856
Workings		1,003			6.743	157,21
	Brush	32			1	500
	All Upland	19,848			12,831	2,500,58
	Stream	350	51,388		8,465	
	All Types	20,198	+			2,569,349



### SUMMARY OF RIBES ERADICATION 1923-1941 KANIKSU OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes
Liddled of on Type	110211111111111111111111111111111111111	MOTITIES	MOTETIE	NOTOD	Man-Days	111,000
Open Reproduction	139,520	29,615	5,853	174,988	132,309	34,441,867
Dense Reproduction	22,524	2,336	60	24,920	13,900	1,963,687
Open Pole	98,977	11,903		110,880	41,801	5,779,124
Dense Pole	21,327	2,541	21	23,889	4,762	452,924
Open Mature	110,494	4,515	105	115,114	29,122	5,641,430
Dense Mature	31,047	601		31,648	3,782	433,532
Cutover	8,183	2,408	51	10,642	9,174	2,620,612
Brush	3,599	596	64	4,259	1,510	365,207
Burn	1,132			1,132	1,354	947,874
Subalpine	1,933	50		1,983	1,032	157,110
Meadow-Field	71	10		81	1	72
All Upland	438,807	54,575	6,154	499,536	238,747	52,803,439
Stream (Hand)	20,581	4,981	366	25,928	45,406	9,218,442
Stream (Slash)	576			576	4,994	288,000
Stream (Machine)	1,030			1,030	7,081	614,076
All Stream	22,187	4,981	366	27,534	57,481	10,120,518
All Types	460,994	59,556	6,520	527,070	296,228	62,923,957

TABLE 7A - FIRST WORKING

		Effective	Total	Per Acre	Rasis					
Eradication Type	Acres	Man-Days	Ribes	Man-Days						
		L	L							
Open Reproduction	139,520	99,408	29,223,902	.71	209					
Dense Reproduction	22,524	11,655	1,700,022	.52	75					
Open Pole	98,977	36,194	5,326,323	.37	54					
Dense Pole	21,327	3,924	402,183	.18	19					
Open Mature	110,494	26,571	5,355,562	.24	48					
Dense Mature	31,047	3,584	415,459	.12	13					
Cutover	8,183	4,285	1,166,470	.52	143					
Brush	3,599	1,104	336,107	.31	93					
Burn	1,132	1,354	947,874	1.20	837					
Subalpine	1,933	1,019	156,522	.53	81					
Meadow-Field	71									
All Upland	438,807	189,098	45,030,424	.43	103					
Stream (Hand)	20,581	36,754	8,254,136	1.79	401					
Stream (Slash)	576	4,994	288,000	8.67	500					
Stream (Machine)	1,030	7,081	614,076	6.87	596					
All Stream	22,187	48,829	9,156,212	2.20	633					
All Types	460,994	237,927	54,186,636	.52	118					
Open Reproduction	29,615	26,165	4,503,107	.88	152					
Dense Reproduction	2,336	2,176	188,872	.93	81					
Open Pole	11,903	5,607	452,801	.47	38					
Dense Pole	2,541	829	50,647	.33	20					
Open Mature	4,515	2,476	284,484	.55	63					
Dense Mature	601	198	18,073	.33	30					
Cutover	2,408	4,844	1,444,436	2.01	600					
Brush	596	347	27,842	. 58	47					
Subalpine	50	13	588	.26	12					
Meadow-Field	10	1	72	.10	7					
All Upland	54,575	42,656	6,970,922	.78	128					
Stream (Hand)	4,981	8,181	935,256	1.64	188					
All Types	59,556	50,837	7,906,178	.85	133					
All Types   59,556   50,837   7,906,178   .85   133  TABLE 7C - THIRD WORKING										
	TABLE 70	: - THIRD V	VORKING							
Open Reproduction	TABLE 70	6,736	714,858	1.15	122					
Open Reproduction Dense Reproduction				1.15	122 125					
	5,853	6,736	714,858							
Dense Reproduction	5,853 60	6,736 69	714,858 74,793	1.15	125					
Dense Reproduction Dense Pole	5,853 60 21	6,736 69 9	714,858 74,793 94	1.15	125 4					
Dense Reproduction Dense Pole Open Mature	5,853 60 21 105	6,736 69 9 75 45	714,858 74,793 94 1,384	1.15 .43 .71	125 4 13					
Dense Reproduction Dense Pole Open Mature Cutover	5,853 60 21 105 51	6,736 69 9 75 45	714,858 74,793 94 1,384 9,706 1,258	1.15 .43 .71 .88	125 4 13 190					
Dense Reproduction Dense Pole Open Mature Cutover Brush	5,853 60 21 105 51 64	6,736 69 9 75 45	714,858 74,793 94 1,384 9,706	1.15 .43 .71 .88 .92	125 4 13 190 20					

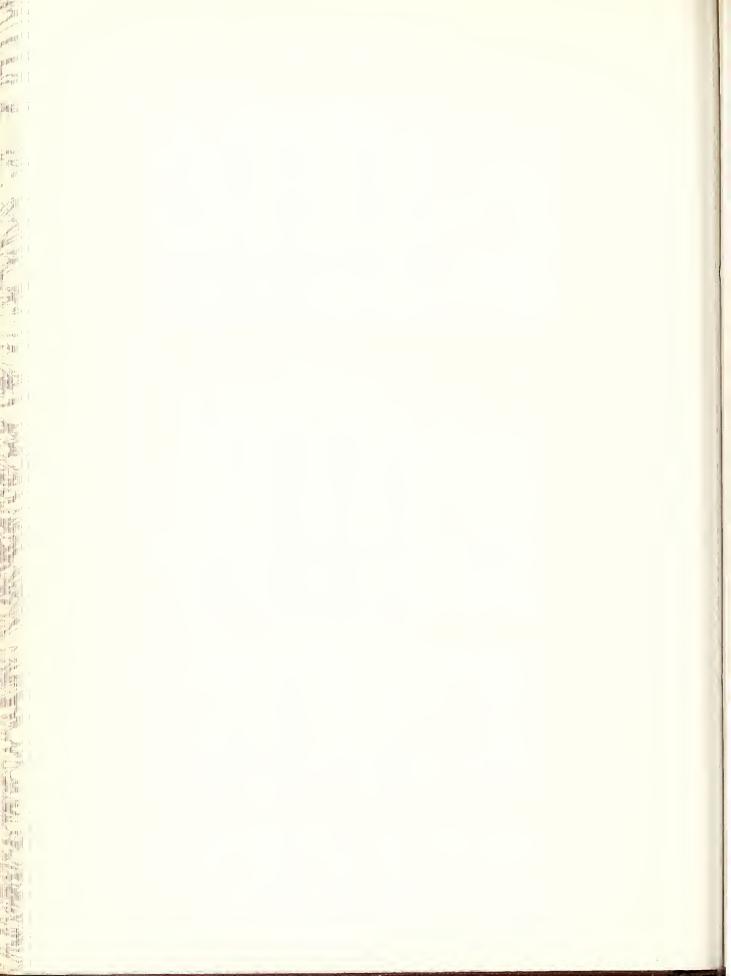
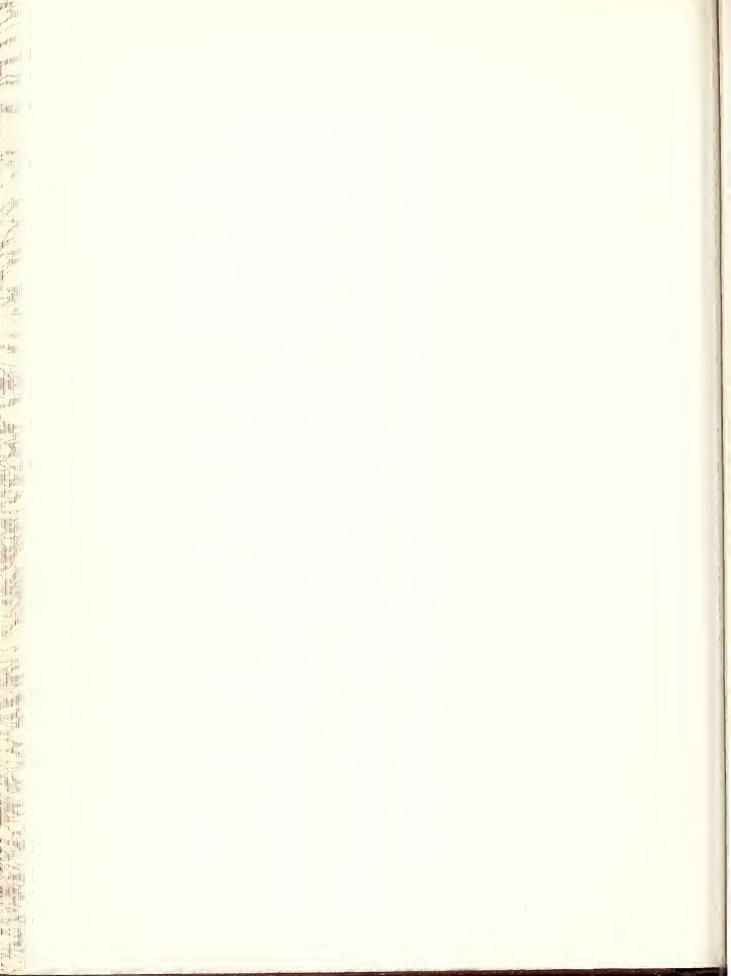


TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1941
. KANIKSU OPERATION

Stata	Working	Class	Acres	Effectivs Man-Days	Total Ribes	Per Acrs Msn-Dsys	
		EQ-Reg.	18,796	6,844	1,066,689	, 36	5
		FS-Reg.	11,145	17,467	2,804,833	1.57	25
		FS-NIRA	72,135	23,866	6,432,376	.33	8
		EQ-ERA			8,318,777		
	T4 4		80,596	48,602		.60	10
`	First	FS-ERA	15,853	10,139	1,880,647	.64	11
		EQ-Coop.	111,150	30,929	8,750,877	.28	7
		F-CCC	54,424	36,378	6,379,138	.67	11
		S&P-CCC	112	748	209,356	6.68	1,86
		Total	364,211	174,973	35,842,693	.48	9
		FS-Rsg.	7,106	3,346	523,407	.47	7
1	1	FS-NIRA	8,544	2,051	292,658	.24	3
		EQ-ERA	14,337	14,806	2,637,381	1.03	18
		FS-ERA	2,737	2,767	182,793	1.01	6
	Second	EQ-Coop.	4,955	3,628	453,912	.73	9
		F-CCC	4,306	9,510	1,120,286	2.21	26
Idsho							
		S&P-CCC	3,577	3,842	743,055	1.07	20
		Total	45,562	39,950	5,953,492	.88	13
		FS-Reg.	209	129	17,944	.62	8
	Third	EQ-ERA	4,108	5,443	377,339	1.32	9
		EQ-Coop.	1,378	1,324	350,082	.96	25
		Total	5,695	6,896	745,365	1.21	13
		EQ-Reg.	18,796	6,844	1,066,689	.36	5
		FS-Reg.	18,460	20,942	3,346,184	1.13	18
		FS-NIRA	80,679	25,917	6,725,034	.32	8
		EQ-ERA			11,333,497	.70	11
	All		99,041	68,851			
	Workings	FS-ERA	18,590	12,906	2,063,440	.69	11
	_	EQ-Coop.	117,483	35,881	9,554,871	.31	8
		F-CCC	58,730	45,888	7,499,424	.78	12
		S&P-CCC	3,689	4,590	952,411	1.24	25
		Totsl	415,468	221,819	42,541,550	.53	10
		FS-Reg.	12,564	11,265	4,691,868	.90	37
		EQ-NIRA	26,733	11,711	4,348,258	.44	16
		FS-NIRA	34,417	12,708	3,858,496	.37	11
	First	EQ-ERA	3,328	5,844	2,190,917	1.76	65
	1				3,254,404		
		F-CCC	19,741	21,426		1.09	16
		Total	96,783	62,954	18,343,943	.65	19
		FS-Reg.	8,082	4,549	1,360,710	.56	16
		EQ-ERA	1,376	1,381	204,383	1.00	14
	Second	FS-ERA	1,949	1,678	154,764	.86	7
		F-CCC	2,587	3,279	232,829	1.27	9
Washington		Totsl	13,994	10,887	1,952,686	.78	14
		FS-Reg.	633	216	75,265	.34	11
	Third	EQ-ERA	192	352	10,513	1.83	5
		Totsl	825	568	85,778	.69	10
		FS-Reg.	21,279	16,030	6,127,843	.75	28
		EQ-NIRA	26,733	11,711	4,348,258	.44	_ 16
	All	FS-NIRA	34,417	12,708	3,858,496	.37	11
	Workings	EQ-ERA	4,896	7,577	2,405,813	1.55	49
	_	FS-ERA	1,949	1,678	154,764	.86	. 7
		F-CCC	22,328	24,705	3,487,233	1.11	15
		Total	111,602	74,409	20,382,407	.67	18
		EQ-Reg.	18,796	6,844	1,066,689	. 36	5
		FS-Reg.	23,709	28,732	7,496,701	1.21	31
		EQ-NIRA	26,733	11,711	4,348,258	.44	16
		FS-NIRA	106,552	36,574	10,290,872	. 34	9
		EQ-ERA	83,924	54,446	10,509,694	.65	12
	First	FS-ERA					
			15,853	10,139	1,880,647	-64	11
		EQ-Coop.	111,150	30,929	8,750,877 9,633,542	.28	7
		F-CCC	74,165	57,804		.78	13
		S&P-CCC	112	748	209,356	6.68	
				748 237,927	209,356 54,186,636	•52	11
		S&P-CCC Totsl FS-Reg.	112 460,994 15,188	748 237,927 7,895	209,356 54,186,636 1,884,117	.52 .52	11
		S&P-CCC Totsl	112 460,994	748 237,927	209,356 54,186,636	•52	11
		S&P-CCC Totsl FS-Reg.	112 460,994 15,188	748 237,927 7,895	209,356 54,186,636 1,884,117	.52 .52	11 12
		S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA	112 460,994 15,188 8,544 15,713	748 237,927 7,895 2,051 16,187	209,356 54,186,636 1,884,117 292,658 2,841,764	.52 .52 .24 1.03	11 12 3 18
	Second	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA	112 460,994 15,188 8,544 15,713 4,686	748 237,927 7,895 2,051 16,187 4,445	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557	.52 .52 .24 1.03	11 12 3 18
Idsho	Second	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop.	112 460,994 15,188 8,544 15,713 4,686 4,955	748 237,927 7,895 2,051 16,187 4,445 3,628	209.356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912	.52 .52 .24 1.03 .95 .73	11 12 3 18 7
snd		S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115	.52 .52 .24 1.03 .95 .73	11 12 3 18 7 9
snd		S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055	.52 .52 .24 1.03 .95 .73 1.86 1.07	11 12 3 18 7 9 19
snd		S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Tota1	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178	.52 .52 .24 1.03 .95 .73 1.86 1.07	11 12 3 18 7 9 19 20
snd		S&P-CCC Tots1 FS-Reg. FS-MIRA EQ-ERA FS-ERA FS-ECC S&P-CCC Tota1 FS-Reg.	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345	209,356 54,186,636 1,884,17 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85	11 12 3 18 7 9 19 20 13
snd		S&P-CCC Totsl FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Total FS-Reg. EQ-ERA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41	11 12 3 18 7 9 19 20 13 11
snd		S&P-CCC Tots1 FS-Reg. FS-NIRA FS-EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Tota1 FS-Reg. EQ-ERA EQ-ERA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,056 7,906,178 93,209 387,852 350,082	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35	11 12 3 18 7 9 19 20 13 11 9
snd		S&P-CCC Totsl FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Total FS-Reg. EQ-ERA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41	11 12 3 18 7 9 19 20 13 11 9
snd		S&P-CCC Total FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC Total FS-Reg. EQ-ERA EQ-COOp. Total	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378 6,520	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464	209,356 54,186,635 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 831,143	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96	11 12 3 18 7 9 20 13 11 9 25
and		S&P-CCC Total FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Total FS-Reg. EQ-ERA EQ-ERA EQ-ERA EQ-ERA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378 6,520 18,796	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844	209.356 54,186,635 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 831,143 1,066,689	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14	11 12 3 18 7 9 19 20 13 11 9 25
and		S&P-CCC Tots1 Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Tots1 FS-Reg. EQ-ERA EQ-Coop. Tots1 EQ-Reg. FS-Reg. FS-Reg. FS-Reg. FS-Reg.	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378 6,520 18,796 39,739	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844 36,972	209,356 54,186,636 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 831,143 1,066,689 9,474,027	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14	11 12 3 18 7 9 19 20 13 11 9 25 12 5
and		S&P-CCC Total FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Total FS-Reg. EQ-ERA EQ-Coop. Total EQ-Reg. EQ-Reg. EQ-Reg. EQ-Reg. EQ-Reg. EQ-Reg.	112 460,994 15,182 8,544 15,713 4,686 4,955 6,893 3,577 59,556 42,300 1,378 6,520 18,796 26,733	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844 66,844	209,356  54,186,636  1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,056 7,906,178 93,209 387,852 350,082 831,143 1,066,689 9,474,027 4,348,258	.52 .52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14 .36 .93	11 12 3 18 7 9 20 13 11 9 25 12 23 16
	Third	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-COOp. F-CCC S&P-CCC Tots1 FS-Reg. EQ-ERA EQ-COOp. Tots1 FS-Reg. EQ-ERA EQ-COOp. Tots1 EQ-Reg. FS-Rsg.	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378 6,520 18,796 39,739 26,733 115,096	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844 36,972 11,711 38,625	209.356 54,186,635 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 831,143 1,066,689 9,474,025 4,348,258 10,583,530	.52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14 .36	1,86 11 12 3 18 7 9 20 13 11 9 25 12 5 23 16 9
and	Third	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-COOP. F-CCC S&P-CCC Tota1 FS-Reg. EQ-Coop. EQ-Coop. EQ-Coop. FS-Reg. EQ-NIRA EQ-NIRA EQ-NIRA EQ-NIRA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378 6,520 18,796 39,739 26,733 115,096 103,937	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844 36,972 11,711 38,625 76,428	209.356 54,186,635 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 381,143 1,066,689 9,474,027 4,348,258 0,582,530	.52 .52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14 .36 .93 .44 .34	11 12 3 18 7 9 20 13 11 25 12 5 23 16 9 13
and	Third	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-COOp. F-CCC S&P-CCC Tots1 FS-Reg. EQ-ERA EQ-COOp. Tots1 FS-Reg. EQ-ERA EQ-COOp. Tots1 EQ-Reg. FS-Rsg.	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 8422 4,300 1,378 6,520 18,796 39,739 26,733 115,096 103,937 20,539	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844 36,972 11,711 38,625	209.356 54,186,635 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 831,143 1,066,689 9,474,025 4,348,258 10,583,530	.52 .52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14 .36 .93 .44 .34 .71	11 12 3 18 7 9 20 13 11 9 25 12 5 23 16
and	Third	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-COOP. F-CCC S&P-CCC Tota1 FS-Reg. EQ-Coop. EQ-Coop. EQ-Coop. FS-Reg. EQ-NIRA EQ-NIRA EQ-NIRA EQ-NIRA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 842 4,300 1,378 6,520 18,796 39,739 26,733 115,096 103,937	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3,842 50,837 345 5,795 1,324 7,464 6,844 36,972 11,711 38,625 76,428	209.356 54,186,635 1,884,117 292,658 2,841,764 337,557 453,912 1,353,115 743,055 7,906,178 93,209 387,852 350,082 381,143 1,066,689 9,474,027 4,348,258 0,582,530	.52 .52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14 .36 .93 .44 .34	11 12 3 18 7 9 20 13 11 19 25 12 5 23 16 9 13
and	Third	S&P-CCC Tots1 FS-Reg. FS-NIRA EQ-ERA FS-ERA EQ-Coop. F-CCC S&P-CCC Tota1 FS-Reg. EQ-ERA EQ-Coop. Tots1 EQ-Reg. FS-Reg. EQ-NIRA FS-NIRA FS-NIRA FS-ERA	112 460,994 15,188 8,544 15,713 4,686 4,955 6,893 3,577 59,556 8422 4,300 1,378 6,520 18,796 39,739 26,733 115,096 103,937 20,539	748 237,927 7,895 2,051 16,187 4,445 3,628 12,789 3.842 50,837 345 5,795 1,324 7,464 7,464 36,972 11,711 38,625 76,428 14,584	209,356  54,186,636  1,884,117  292,658  2,841,764  337,557  743,056  7,906,178  93,209  387,852  350,082  81,143  1,066,689  9,474,027  4,348,258  10,583,530  13,733,310  2,218,204	.52 .52 .52 .24 1.03 .95 .73 1.86 1.07 .85 .41 1.35 .96 1.14 .36 .93 .44 .34 .71	11 12 3 18 7 9 19 20 13 11 25 12 5 23 16 9 13 16 17 18 18 18 19 19 20 20 20 20 20 20 20 20 20 20



OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1941 KANIKSU OPERATION

TABLE 9

		Number	Number of Acres Worked by Ownership Classes						
			Federal	L					
		Forest	Public						
State	Working	Service	Domain	Total	State	Private	Total		
	First	184,979	54	185,033	110,916	68,262	364,211		
Idaho	Second	24,261		24,261	12,961	8,340	45,562		
Idano	Third	104		104	4,778	813	5,695		
	All Workings	209,344	54	209,398	128,655	77,415	415,468		
	First	68,053		68,053	2,080	26,650	96,783		
Woshinsten	Second	12,950		12,950		1,044	13,994		
Washington	Third	633		633		192	825		
	All Workings	81,636		81,636	2,080	27,886	111,602		
Idaho	First	253,032	54	253,086	112,996	94,912	460,994		
and	Second	37,211		37,211	12,961	9,384	59,556		
Washington	Third	737		737	4,778	1,005	6,520		
Masurukcon	All Workings	290,980	54	291,034	130,735	105,301	527,070		

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1941
KANIKSU OPERATION

					Acres Mature	
					Stands on	
		Nur	mber of A	cres	Which Working	Total Acres
State	Ownership Class	Worked	Unworked	Total	Is Deferred	White Pine
	Forest Service	184,979	43,704	228,683	26,202	254,885
	Public Domain	54	506	560		560
Idaho	Subtotal Federal	185,033	44,210	229,243	26,202	255,445
Idano	State	110,916	17,524	128,440	30	128,470
	Private	68,262	44,058	112,320	5,390	117,710
	Total	364,211	105,792	470,003	31,622	501,625
	Forest Service	68,053	31,257	99,310		99,310
Woshinsten	State	2,080	2,030	4,110		4,110
Washington	Private	26,650	11,575	38,225		38,225
	Total	96,783	44,862	141,645		141,645
	Forest Service	253,032	74,961	327,993	26,202	354,195
Idaho	Public Domain	54	506	560		560
and	Subtotal Federal	253,086	75,467	328,553	26,202	354,755
	State	112,996	19,554	132,550	30	132,580
Washington	Private	94,912	55,633	150,545	5,390	155,935
	Total	460,994	150,654	611,648	31,622	643,270

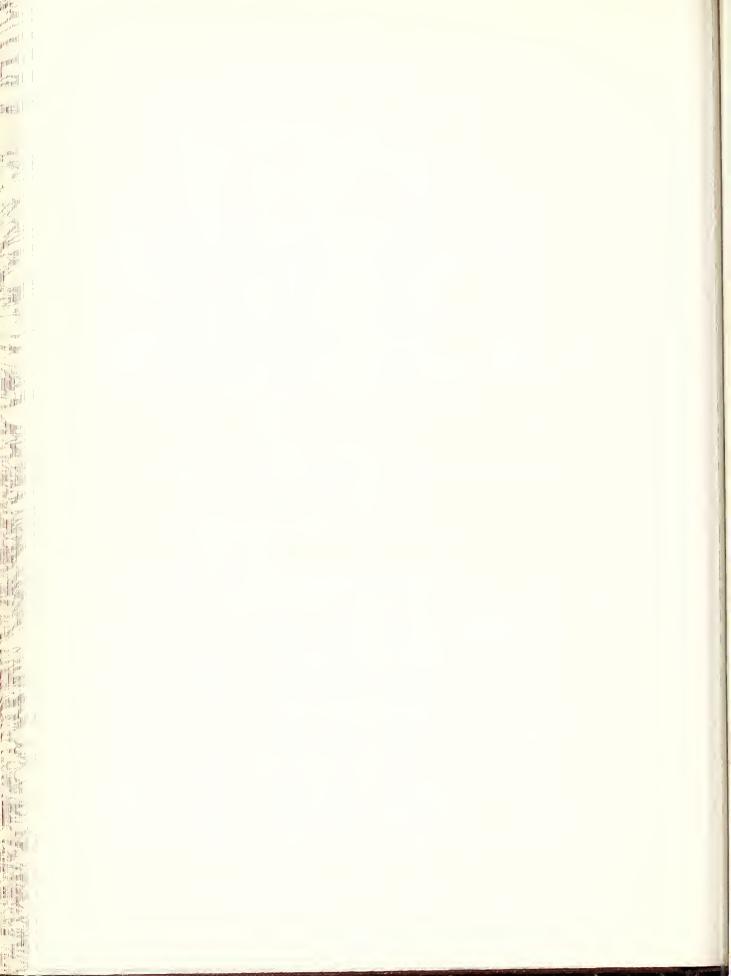
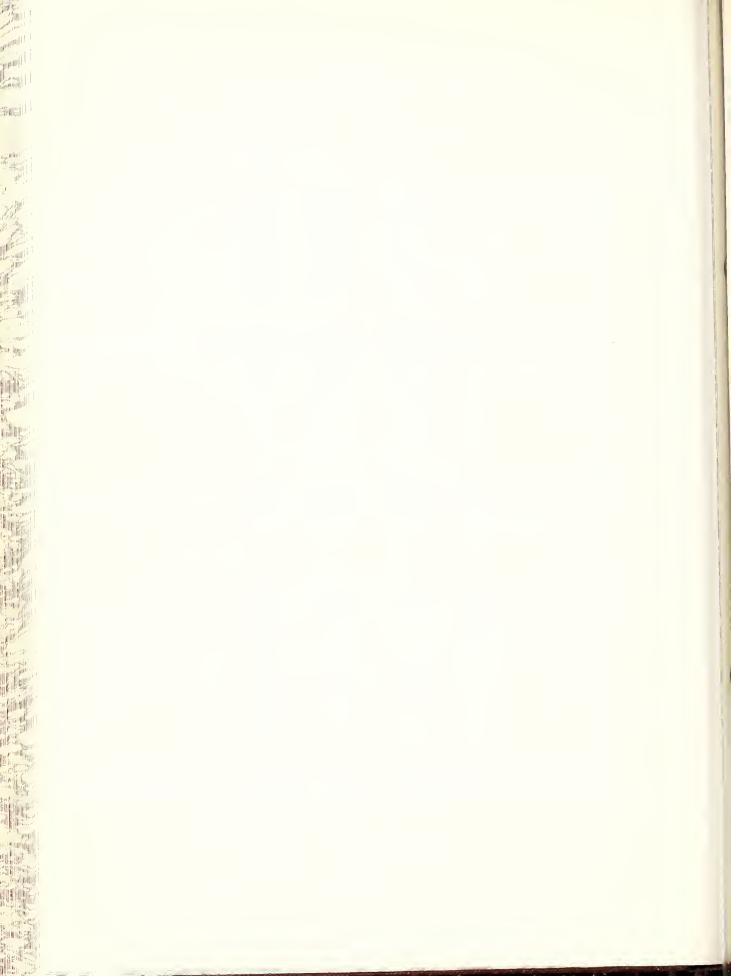


TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1941
KANIKSU OPERATION

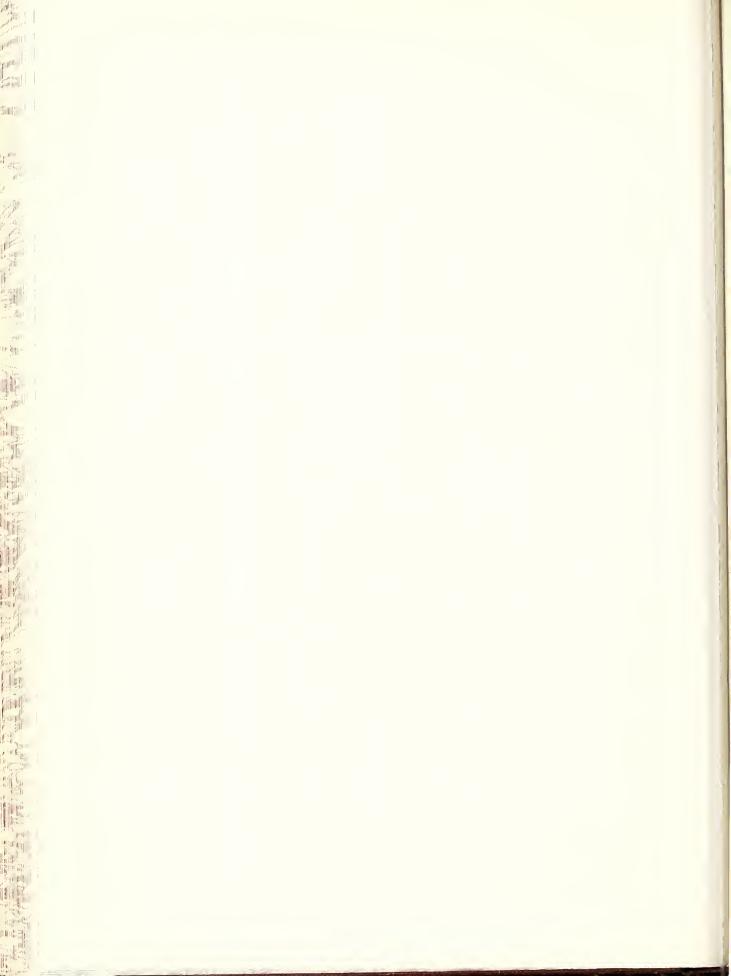
				Ribe	s by Specie	es		
			Ribes	Ribes	Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum			acerifolium	
	Open Reproduction	139,520	7,963,403	21,099,446	158,106	2,947		29,223,902
	Dense Reproduction	22,524	1,234,765	398,962	66,295			1,700,022
	Open Pole	98,977	2,483,095	2,632,075	186,047	21,192	3,914	5,326,323
	Dense Pole	21,327	268,016	111,257	22,388	522		402,183
	Open Mature	110,494	3,704,730	1,526,083	122,722		2,027	5,355,562
	Dense Mature	31,047	295,808	87,912	31,739			415,459
First	Cutover	8,183	517,676	603,790	45,004			1,166,470
First	Brush	3,599	68,387	203,158	64,562			336,107
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,933	116,392	40,111	19			156,522
	Meadow-Field	71						
	All Upland	438,807	16,805,788	27,493,196	700,838	24,661	5,941	45,030,424
	Stream	22,187		424,045	3,854,943		19,584	9,156,212
	All Types	460,994	21,663,428	27,917,241	4,555,781	24,661	25,525	54,186,636
	Open Reproduction	29,615	1,193,339	3,282,960	26,808			4,503,107
	Dense Reproduction	2,336	133,367	53,987	1,518			188,872
	Open Pole	11,903	223,712	220,792	8,297			452,801
	Dense Pole	2,541	39,530	8,641	2,476			50,647
	Open Mature	4,515	139,415	141,853	3,216			284,484
	Dense Mature	601	13,802	3,613	658			18,073
Second	Cutover	2,408	348,938	1,085,395	10,103			1,444,436
	Brush	596	15,641	11,326	875			27,842
	Subalpine	50	461	127				588
	Meadow-Field	10	72					72
	All Upland	54,575	2,108,277	4,808,694	53,951			6,970,922
	Stream	4,981	484,646	46,488	404,122			935,256
	All Types	59,556		4,855,182	458,073			7,906,178
	Open Reproduction	5,853	206,514	507,060	1,284			714,858
	Dense Reproduction	60	1,305	73,488				74,793
	Dense Pole	21	43	51				94
	Open Mature	105	713	671				1,384
Third	Cutover	51	4,025	680	5,001			9,706
	Brush	64	391	867				1,258
	All Upland	6,154	212,991	582,817	6,285			802,093
	Stream	366	24,807	4,044	199			29,050
	All Types	6,520	237,798	586,861	6,484			831,143
	Open Reproduction	174,988	9,363,256	24,889,466	186,198	2,947		34,441,867
	Dense Reproduction	24,920	1,369,437	526,437	67,813			1,963,687
	Open Pole	110,880	2,706,807	2,852,867	194,344	21,192	3,914	5,779,124
	Dense Pole	23,889	307,589	119,949	24,864	522		452,924
	Open Mature	115,114	3,844,858	1,668,607	125,938		2,027	5,641,430
	Dense Mature	31,648	309,610	91,525	32,397		,	433,532
All	Cutover	10,642	870,639	1,689,865	60,108			2,620,612
Workings		4,259	84,419	215,351	65,437			365,207
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,983	116,853	40,238	19			157,110
	Meadow-Field	81	72	25,250				72
	All Upland		19,127,056	32,884,707	761,074	24,661	5,941	52,803,439
	Stream	27,534		474,577	4,259,264		19,584	10,120,518
	Doleam							



## Camp NATIONAL PARK GLACIER 1- N.P. C.C.C. Number of Camps - 1 Number of Men - 25 N.P. C.C.C. I-N.P. Checker Number of Camps - 2 Number of Men - 45 N.P. REG. 2-N.P.-Regular Camps BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE MOUNT RAINIER NATIONAL PARK STATE PARKS ORGANIZATION CHART Technical Supervisor M. C. RILEY NATIONAL AND I-N.P. C.C.C. Camp Number of Camps - 1 Number of Men - 25 N.P.-C.C.C. I - E.Q. - E.R. A. Checker Number of Camps - 2 Number of Men - 55 MOUNT SPOKANE E.Q.-E.R. A. 2-E.Q.-E.R.A. Camps

Total Number of Men on Blister Rust Work - 150

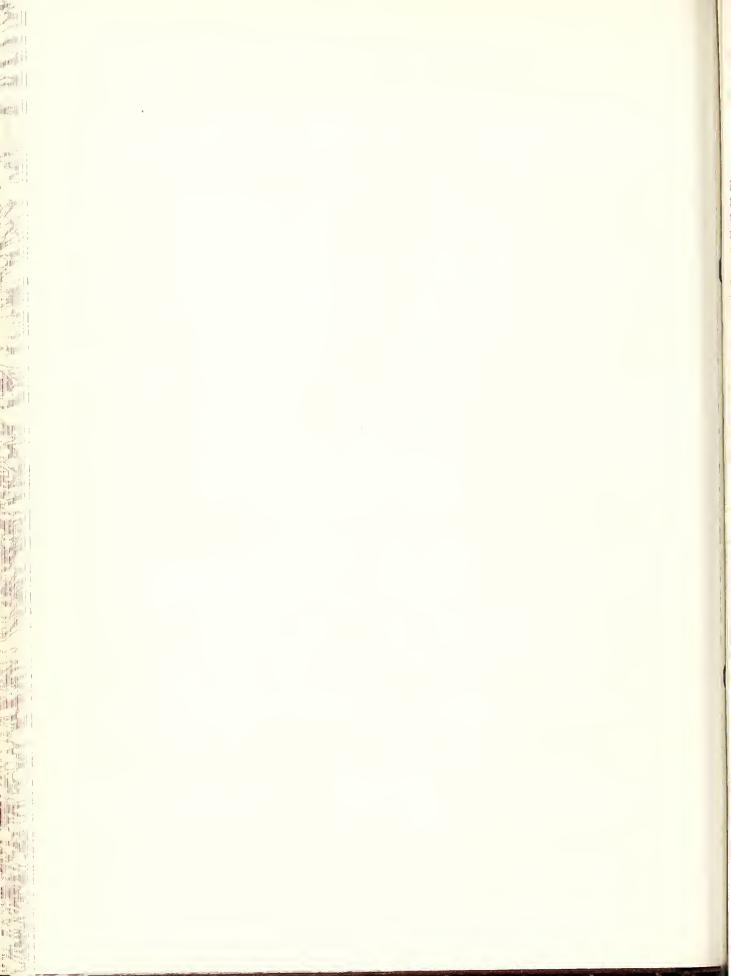
1941



1941 WORK CONTROL AREA B 60 SECOND WORKING WILLAMETTE AND SOISE MERIDIANS 9 R 45 E ANNUAL REPORT 1941 M.C.RILEY T 26 M

MT. SPOKANE OPERATION BLISTER RUST CONTROL WORKING AREA

SCALE



# BLISTER RUST CONTROL WORK, MOUNT SPOKANE OPERATION, 1941 By M. C. Riley Associate Forester

### INTRODUCTION

Blister rust control work on the Mount Spokane operation during the 1941 field season consisted of a continuation of the work started in 1935. Due to the difficulty in securing labor assignments there were not sufficient men available to extend the initial working; in fact, it was not possible to do all of the second and third working which should have been done. For the same reason it was not feasible to establish a camp on the Washington side of the operation, although a noncamp project of 12 to 22 men was used during the first part of the season.

Field work started with the noncamp project on April 18 and on August 25 the Washington and Idaho men were placed in one camp. The Idaho camp opened on May 1 and finished ribes eradication on October 7.

### ORGANIZATION AND ADMINISTRATION

All work on the Mount Spokane operation was financed entirely by funds allotted to the Bureau of Entomology and Plant Quarantine under the Emergency Relief Act. Since none of the lands are a part of any cooperating timber protective agency or National Forest administrative unit, the only cooperators were owners of land used as a camp site. The time of the operation supervisor was about equally divided between the Mount Spokane operation and the work at Mount Rainier National Park, with some time spent at Glacier National Park as illustrated in the accompanying organization chart.

### LOCATION AND DESCRIPTION OF AREAS

The work in Washington centered around the southwest corner of the control area on tributaries of Deadman Creek and at the extreme head of Spirit Creek on both of which areas second and third working was done on high value white pine reproduction areas. The choice of the location of the work in Washington was determined largely by accessibility since much of it was done by the noncamp project. In Idaho efforts were confined to high priority areas worked originally in 1938 where blister rust infection was on the increase.

Ribes viscosissimum and R. lacustre were the species found during the course of the season. In Idaho there were approximately twice as many R. lacustre as R. viscosissimum, while in Washington practically the reverse was true due to more ground disturbance caused by logging operations and by woodcutting.

All classes of working and ribes conditions were encountered. A higher percentage of the area worked can now be classed as being on a maintenance basis than has been the case the last few years, due to there having been a higher percentage of third working than has been the case before. On the other hand, some small areas continue to show seedling occurrence even after third working due to continued disturbance of the soil.

The effects of the 1937 wave of infection were apparent this season and as a result it was difficult to find an area or drainage without infection. However, no new heavy centers were found and the exterior limits of infection were not extended.

### METHODS AND EQUIPMENT

All eradication work was performed by the hand pulling method. It was the constant aim of all concerned to reduce costs and improve efficiency. It was possible to lay string lines in advance to a greater extent than formerly and a specially trained crew was engaged in this and in mop-up work continually with satisfactory results.

### CHECKING

Checking work was conducted on the basis of a four per cent sample to give immediate and detailed information on the condition of the areas. Advance surveys were conducted on all areas worked and practically the entire worked area was given a regular check. Due to employment limitations it was not possible to employ a checker for the entire season and as a result not as much post check was accomplished as in former years. Whenever possible the checkers assisted the camp bosses in laying out crew divisions, assisting with rework areas and supervising regular eradication work.

### CANKER ELIMINATION

When, because of weather conditions, it became impossible to do any further effective ribes eradication work, the crew started canker elimination. The men were given careful training in canker identification, method of canker removal, identification of killing cankers and the amount of pruning to be done on each tree. It was found that approximately the same width of strip could be used for the same number of men per crew as in ribes eradication and it was also found feasible to lay string lines in advance. The areas where this work was conducted were all of the open reproduction type and were excellent sites for the growth of white pine. One area was very heavily infected and it is estimated that about 12 per cent of the trees were removed because of killing cankers. On most of the areas the majority of the infection was of 1937 origin, and was of sufficient age for heavy acciospore production in 1941. Canker elimination work started on October 7 and ended on December 31.

A total of 680 acres was covered in 813 man-days. There were 425,993 trees treated, of which 12,852 were removed. On a per acre basis, it required 1.20 effective man-days to treat 626 trees, including an average of 19 trees per acre which were removed because of killing cankers.

#### STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables:

TABLE 1

## EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941 MOUNT SPOKANE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology	Regular	\$ 2,722.79
and	Idaho-ERA	11,541.29
Plant Quarantine	WashERA	9,263.78
Total		\$23,527.86

### TABLE 2

### CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941 MOUNT SPOKANE OPERATION

	Bureau of Entomology and Plant Quarantine					
Item	Regular	ERA	Total			
Salaries, permanent men	\$2,496.11		\$ 2,496.11			
Salaries, temporary men		\$ 4,126.99	4,126.99			
Wages, temporary laborers		13,531.75	13,531.75			
Subsistence supplies	158.45	2,424.28	2,582.73			
Equipment		109.55	109.55			
Travel and transportation	65.97	305.18	371.15			
Other supplies	2.26	307.32	309.58			
Total	\$2,722.79	\$20,805.07	\$23,527.86			

### TABLE 2A

## DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS MOUNT SPOKANE OPERATION

Program	Number of Effective Man-Days	. ~	nditures	Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 2,496.11	
EQ-ERA	1,961	EQ-ERA EQ-Reg. Total	14,943.34 226.68 15,170.02	
Canker Elimination	813	EQ-ERA	5,861.73	7.21
Total Cost of 1941 Prog	\$23,527.86			

Number of meals served 13,089 Average cost per meal \$0.155 Pounds of twine used 361



### SUMMARY OF RIBES ERADICATION, 1941 MOUNT SPOKANE OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres Second Working	Acres Third Working		Effective Man-Days	Total Ribes	Pe	Remaining r Acre Live Stem
Open Reproduction	480	498	978	1,151	75,202	3.6	4.8
Dense Reproduction		6	6	5	48	0	0
Open Pole	268	180	448	444	87,038	.9	.2
Dense Pole		15	15	11	363	0	0
Open Mature		26	26	74	27,452		
Brush	48	25	73	116	8,551	0	0
All Upland	796	750	1,546	1,801	198,654	.7	1.0
Stream (Hand)	63	29	92	160	19,993	7.4	9.3
All Types	859	779	1,638	1,961	218,647	. 9	1.2

TABLE 3B - SECOND WORKING

						Dan	Daniel
		700		_ ,			Remaining
		Effective		Per Acre			
Eradication Type	Acres	Man-Days	Ribes	Man-Days	Ribes	Bushes	Live Stem
Open Reproduction	480	671	31,048	1.40	65	.6	1.6
Open Pole	268	189	26,505	.71	99	.2	.4
Brush	48	100	8,056	2.08	168	C	0
All Upland	796	960	65,609	1.21	82	.5	1.2
Stream (Hand)	63	103	9,818	1.63	156	7.4	9.3
All Types	859	1,063	75,427	1.24	88	.8	1.1
		TABLE 3C -	- THIRD I	WORKING			
Open Reproduction	498	480	44,154	.96	89	6.8	8.3
Dense Reproduction	6	5	48	.83	8	0	0
Open Pole	180	255	60,533	1.42	336	.2	.1
Dense Pole	15	11	363	.73	24	0	0
Open Mature	26	74	27,452	2.85	1,056		
Brush	25	16	495	.64	20	0	0
All Upland	750	841	133,045	1.12	177	1.4	.2
Stream (Hand)	29	57	10,175	1.97	351	1.7	2.7
All Types	779	898	143,220	1.15	184	1.5	1.4

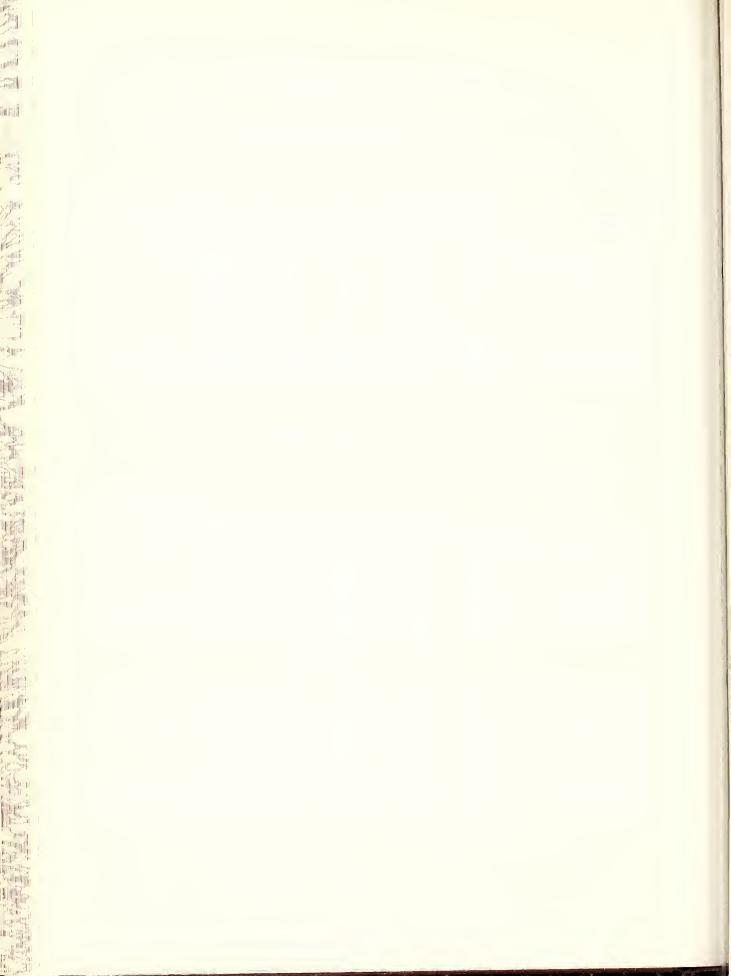


TABLE 4
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Man-Days		Per	Remaining r Acre Live Stem
Idaho	Second	EQ-ERA	556	851	49,322	1.53	89	1.1	2.2
	Second	EQ-ERA	303	212	26,105	.70	86	.2	.4
Washington	Third	EQ-ERA	779	898	143,220	1.15	184	1.5	1.4
	All Workings	EQ-ERA	1,082	1,110	169,325	1.03	156	1.0	1.0
Idaho	Second	EQ-ERA	859	1,063	75,427	1.24	88	.8	1.5
and	Third	EQ-ERA	779	898	143,220	1.15	184	1.5	1.4
Washington	All Workings	EQ-ERA	1,638	1,961	218,647	1.20	133	1.0	1.3

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941

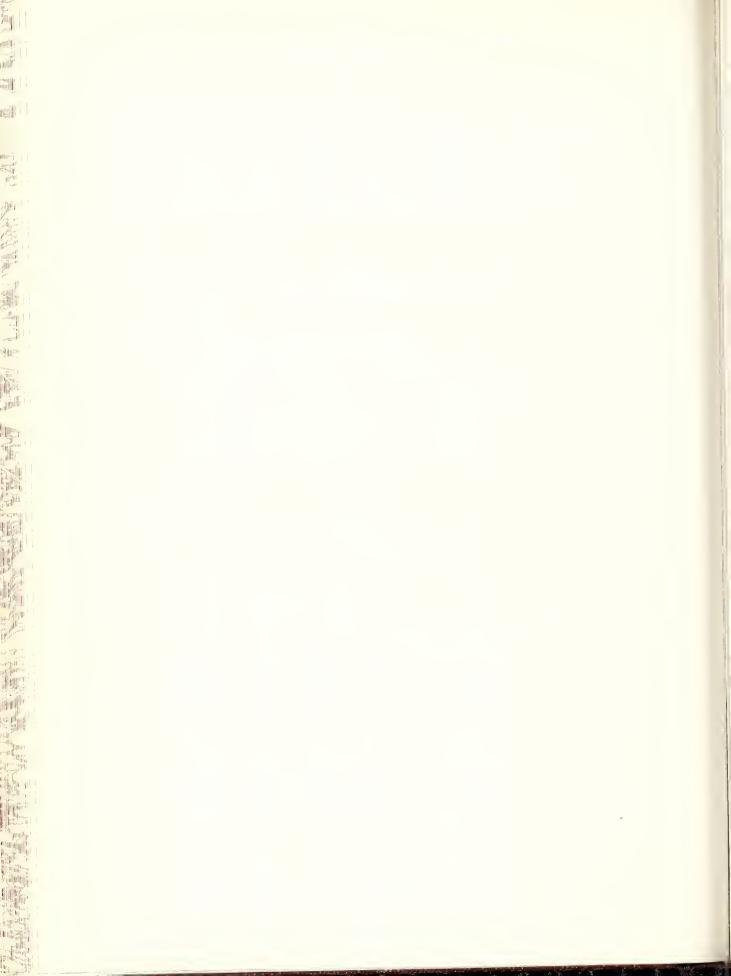
MOUNT SPOKANE OPERATION

		of Entomology a	Number of Acres Worked by Bureau of Entomology and Plant Quarantine						
State	Working	Public Domain	State	Private	Total				
Idaho	Second	53	207	296	556				
	Second			303	303				
Washington	Third		·	779	779				
	Total			1,082	1,082				
	Second	53	207	599	859				
Total	Third			779	779				
	Total	53	207	1,378	1,638				

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
MOUNT SPOKANE OPERATION

			Ribes	by Species	
			Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum	Ribes
	Open Reproduction	480	22,626	8,422	31,048
	Open Pole	268	4,400	22,105	26,505
Second	Brush	48	71	7,985	8,056
	All Upland	796	27,097	38,512	65,609
	Stream	63	9,791	27	9,818
	All Types	859	36,888	38,539	75,427
	Open Reproduction	498	18,359	25,795	44,154
	Dense Reproduction	6	12	36	48
	Open Pole	180	14,413	46,120	60,533
	Dense Pole	15	110	253	363
Third	Open Mature	26	11,684	15,768	27,452
	Brush	25	154	341	495
	All Upland	750	44,732	88,313	133,045
	Stream	29	8,638	1,537	10,175
	All Types	779	53,370	89,850	143,220
	Open Reproduction	978	40,985	34,217	75,202
	Dense Reproduction	6	12	36	48
	Open Pole	448	18,813	68,225	87,038
A11	Dense Pole	15	110	253	363
	Open Mature	26	11,684	15,768	27,452
Workings	Brush	73	225	8,326	8,551
	All Upland	1,546	71,829	126,825	198,654
	Stream	92	18,429	1,564	19,993
	All Types	1,638	90,258	128,389	218,647



### SUMMARY OF RIBES ERADICATION, 1935-1941 MOUNT SPOKANE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working		Total Acres		Total Ribes
Open Reproduction	8,032	4,297	1,856	14,185	29,806	8,411,894
Dense Reproduction	376	215	75	666	957	260,703
Open Pole	8,932	4,188	1,792	14,912	16,195	3,945,456
Dense Pole	754	231	26	1,011	474	75,982
Open Mature	1,076	727	157	1,960	3,620	758,108
Dense Mature	735	102		837	185	34,017
Cutover	526	760	186	1,472	2,015	972,489
Brush	1,924	649	280	2,853	3,137	402,942
Subalpine	515	181	88	784	502	100,944
All Upland	22,870	11,350	4,460	38,680	56,891	14,962,535
Stream (Hand)	507	285	29	821	3,494	1,069,551
All Types	23,377	11,635	4,489	39,501	60,385	16,032,086

TABLE 7A - FIRST WORKING

					-
		Effective	Total	Per Acre	
Eradication Type	Acres	Man-Days	Ribes	Man-Days	Ribes
Open Reproduction	8,032	23,220	7,196,194	2.89	896
Dense Reproduction	376	592	170,078	1.57	452
Open Pole	8,932	11,407	3,114,515	1.28	349
Dense Pole	754	331	59,815	.44	79
Open Mature	1,076	2,667	542,489	2.48	504
Dense Mature	735	165	33,155	.22	45
Cutover	526	710	236,846	1.35	450
Brush	1,924	1,923	289,058	1.00	150
Subalpine	515	334	85,746		166
All Upland	22,870	41,349	11,727,896	1.81	513
Stream (Hand)	507	2,962	990,922		1,955
All Types	23,377	44,311	12,718,818	1.90	544
	TABLE 7	B - SECONI	WORKING		
Open Reproduction	4,297	4,966	852,030	1.16	198
Dense Reproduction	215	290	61,681	1.35	287
Open Pole	4,188	3,479	619,590	.83	148
Dense Pole	231	122	15,418		67
Open Mature	727	770	161,095	1.06	222
Dense Mature	102	20	862	.20	8
Cutover	760	1,092	669,650	1.44	881
Brush	649	1,047	96,236	1.61	148
Subalpine	181	129	9,850		54
All Upland	11,350	11,915	2,486,412		219
Stream (Hand)	285	475	68,454	1.67	240
All Types	11,635	12,390	2,554,866	1.06	220
	TABLE 7	C - THIRD			
Open Reproduction	1,856	1,620	363,670		196
Dense Reproduction	75	75	28,944		386
Open Pole	1,792	1,309	211,351		118
Dense Pole	26	21	749		29
Open Mature	157	183	54,524		347
Cutover	186	213	65,993		355
Brush	280	167	17,648		63
Subalpine	88	39	5,348		61
All Upland	4,460	3,627	748,227	.81	168
Stream (Hand)	29	57	10,175		351
All Types	4,489	3,684	758,402	.82	169

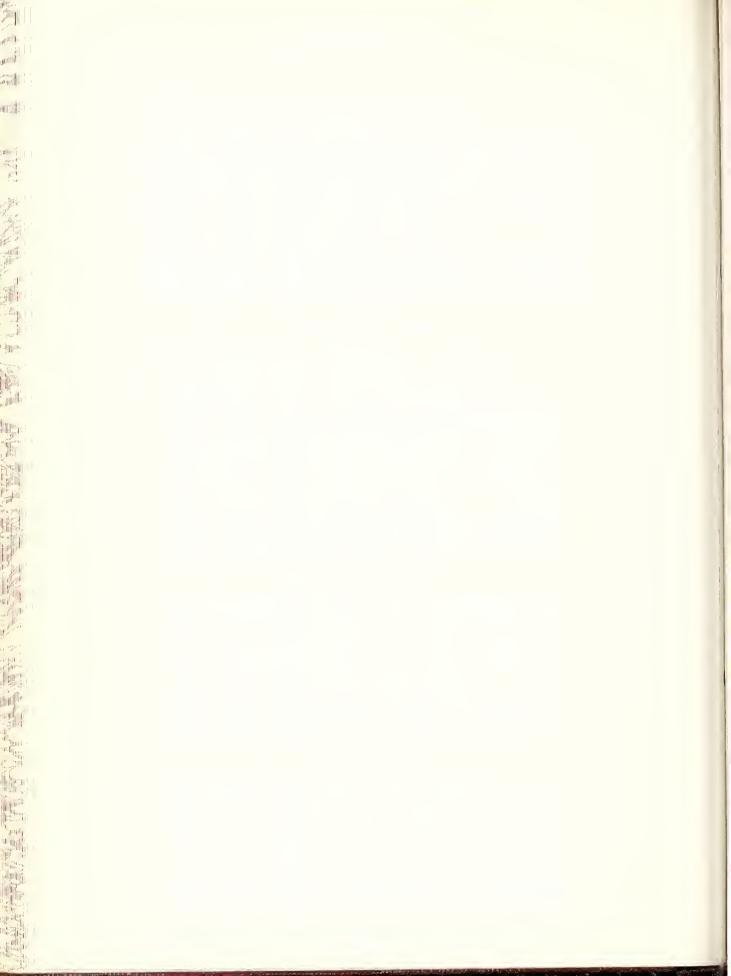


TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935-1941
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Man-Days	
	First	EQ-ERA	5,282	14,974	4,835,292	2.83	915
Idaho	Second	EQ-ERA	1,091	1,559	125,083	1.43	115
	All Workings	EQ-ERA	6,373	16,533	4,960,375	2.59	778
	First	EQ-ERA	18,095	29,337	7,883,526	1.62	436
Washington	Second	EQ-ERA	10,544	10,831	2,429,783	1.03	230
Washington	Third	EQ-ERA	4,489	3,684	758,402	.82	169
	All Workings	EQ-ERA	33,128	43,852	11,071,711	1.32	334
Idaho	First	EQ-ERA	23,377	44,311	12,718,818	1.90	544
and	Second	EQ-ERA	11,635	12,390	2,554,866	1.06	220
	Third	EQ-ERA	4,489	3,684	758,402	.82	169
Washington	All Workings	EQ-ERA	39,501	60,385	16,032,086	1.53	406

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935-1941

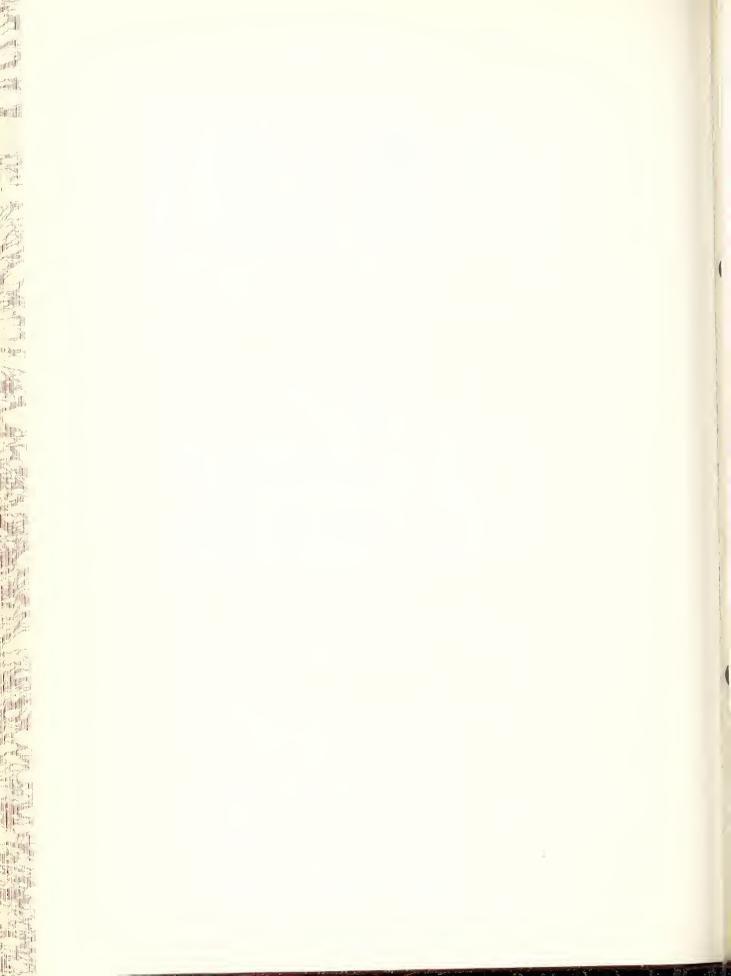
MOUNT SPOKANE OPERATION

			umber of		s Worked Classes	ì	
			ederal				
		Forest	Public		:		
State	Working	Service	Domain	Total	State	Private	Total
	First	310	170	480	1,258	3,544	5,282
Idaho	Second		53	53	616	422	1,091
	Total	310	223	533	1,874	3,966	6,373
	First		315	315	4,752	13,028	18,095
Washington	Second		60	60	3,935	6,549	10,544
Masuringcon	Third				2,114	2,375	4,489
	Total		375	375	10,801	21,952	33,128
	First	310	485	795	6,010	16,572	23,377
Total	Second		113	113	4,551	6,971	11,635
Total	Third				2,114	2,375	4,489
	Total	310	598	908	12,675	25,918	39,501

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1935-1941
MOUNT SPOKANE OPERATION

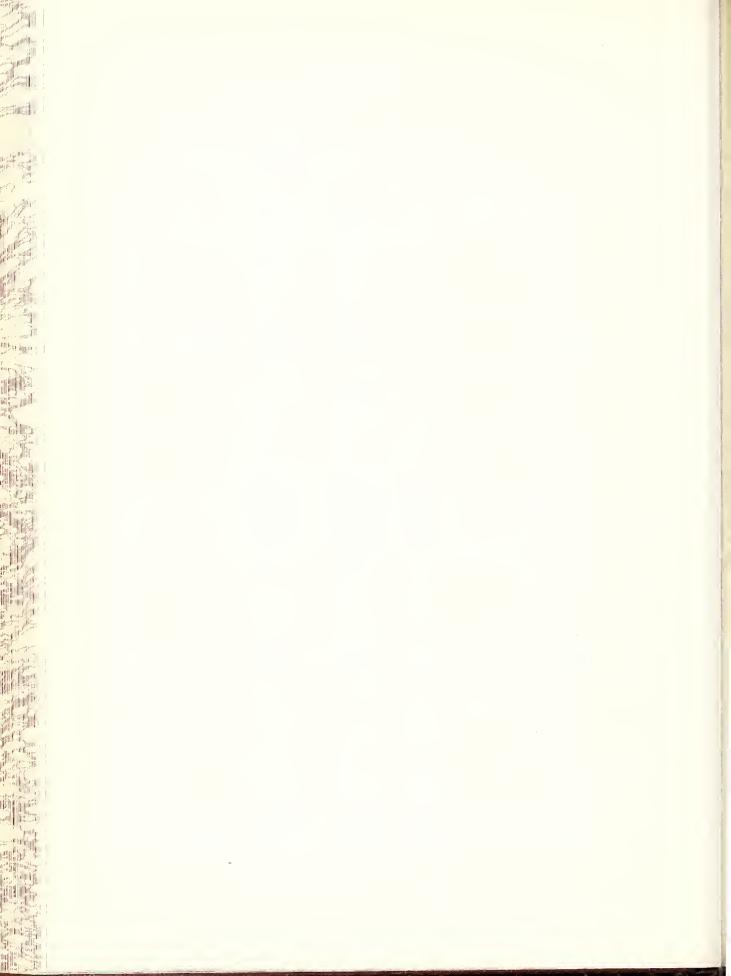
		Nur	mber of A	cres
State	Ownership Class			Total
	Forest Service	310	80	390
	Public Domain	170	255	425
73-3-	Subtotal Federal	480	335	815
Idaho	State	1,258	467	1,725
	Private	3,544	9,426	12,970
	Total	5,282	10,228	15,510
	Public Domain	315		315
Mochineter	State	4,752	988	5,740
Washington	Private	13,028	367	13,395
	Total	18,095	1,355	19,450
	Forest Service	310	80	390
	Public Domain	485	255	740
Total	Subtotal Federal	795	335	1,130
TOTAL	State	6,010	1,455	7,465
	Private	16,572	9,793	26,365
	Total	23,377	11,583	34,960

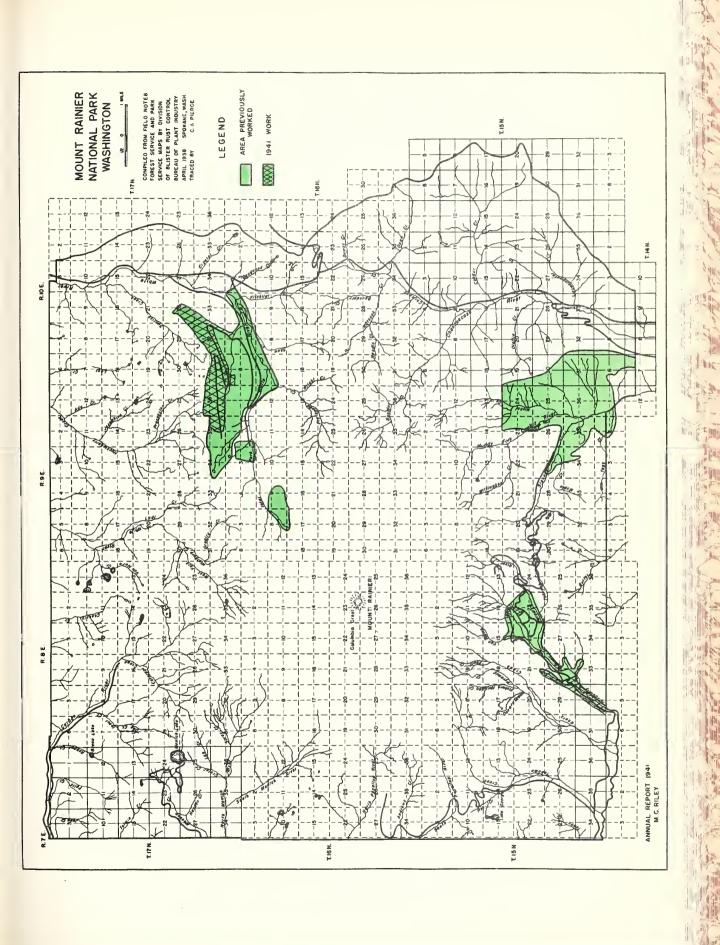


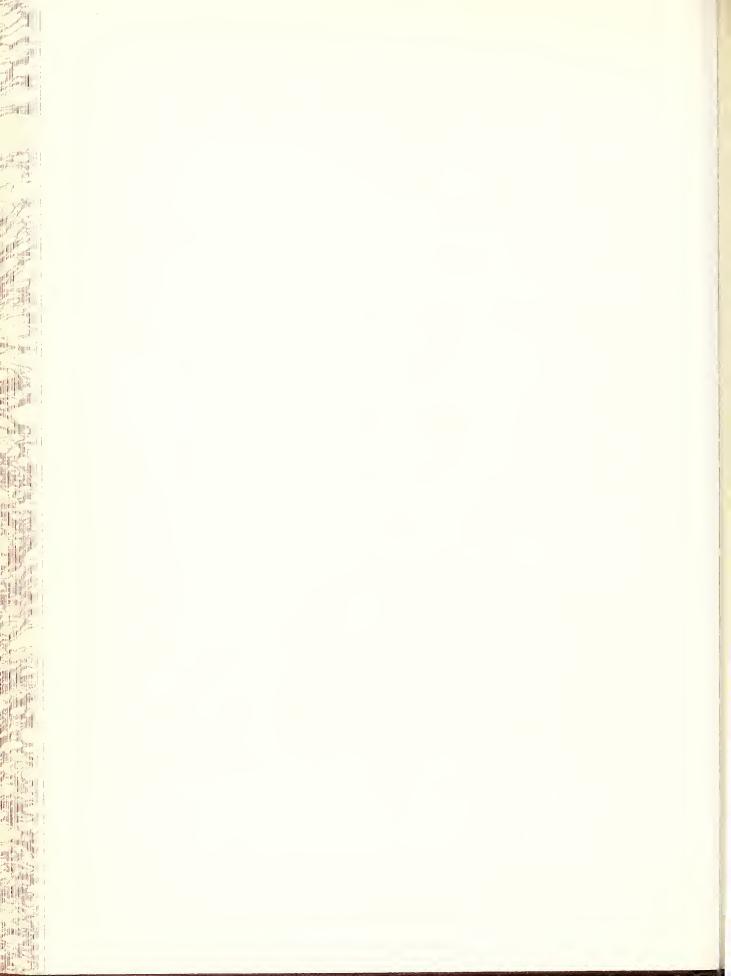
TOTAL RIBES BY SPECIES ERADICATED, 1935-1941
MOUNT SPOKANE OPERATION

TABLE 11

			Ri	ibes by Species		
			Ribes	Ribes	Ribes	Total
Working	Eradication Type	Acres	lacustre	viscosissimum	inerme	Ribes
	Open Reproduction	8,032	2,185,192	4,998,337	12,665	7,196,194
	Dense Reproduction			24,527		170,078
	Open Pole	8,932	1,503,900			3,114,515
	Dense Pole	754	34,973	24,842		59,815
	Open Mature	1,076		283,034		542,489
First	Dense Mature	735	11,281	21,874		33,155
FILESC	Cutover	526		100,187		236,846
	Brush	1,924		203,168		289,058
	Subalpine	515		39,323		85,746
	All Upland	22,870	4,409,324	7,305,907	12,665	11,727,896
	Stream	507		67,807	232,997	
	All Types	23,377	5,099,442			12,718,818
	Open Reproduction	4,297				852,030
	Dense Reproduction	215		9,197		61,681
	Open Pole	4,188		371,104		619,590
	Dense Pole	231	6,476	8,942		15,418
	Open Mature	727	48,455	112,640		161,095
	Dense Mature	102	463	399		862
Second	Cutover	760		329,383		669,650
	Brush	649	40,536	55,700		96,236
	Subalpine	181	4,970	4,880		9,850
	All Upland		1,000,162			2,486,412
	Stream	285	65,110	3,344		68,454
	All Types		1,065,272			2,554,866
	Open Reproduction	1,856				363,670
	Dense Reproduction	75	23,538			28,944
	Open Pole	1,792	81,376	129,975		211,351
	Dense Pole	26	264	485		749
	Open Mature	157	20,420	34,104		54,524
Third	Cutover	186	49,466	16,527		65,993
	Brush	280	4,911	12,737		17,648
	Subalpine	88	2,510	2,838		5,348
	All Upland	4,460	342,965	405,262		748,227
	Stream	29		1,537		10,175
	All Types	4,489		406,799		758,402
	Open Reproduction		2,603,697	5,795,532	12,665	8,411,894
	Dense Reproduction			39,130	12,000	260,703
	Open Pole		1,833,762	2,111,694		3,945,456
	Dense Pole	1,011		34,269		75,982
	Open Mature	1,960		429,778		
All	Dense Mature	837	11,744	22,273		758,108 34,017
Workings		1,472		446,097		
MOTETINES	Brush	2,853		271,605		972,489
	Subalpine	784				402,942
	All Upland		5,752,451	47,041 9,197,419	19 665	100,944
	Stream	821		72,688		14,962,535
			763,866			1,069,551
	All Types	39,501	6,516,317	9,270,107	240,662	16,032,086







### BLISTER RUST CONTROL WORK MOUNT RAINIER NATIONAL PARK, 1941

By M. C. Riley Associate Forester

Ribes eradication on Mount Rainier National Park during the 1941 field season was performed by CCC enrollees from the main camp at Packwood, who worked on the Stevens Canyon area, and by men employed on regular funds, who worked on the Longmire and White River areas. Near the end of the season these latter two camps were combined at White River. A total of approximately 97 men was employed on blister rust control work during the season.

The CCC enrollees working on the Stevens Canyon area started ribes eradication on June 5 and the side camp was discontinued on July 15 due to lack of funds for packing charges, low enrollment, and the ultimate abandonment of the main camp. These men were supervised by an experienced blister rust foreman.

The crews paid from regular funds started work on July 25 at Longmire and on July 28 at White River. Due to inclement weather and the nature of the ground cover the crew at Longmire was moved to White River early in September where work was continued on ribes eradication until October 1. The regular crews were supervised by experienced blister rust foremen who were released from their CCC duties upon the curtailment of that program. A checker was employed until September 1 and his time was very well spent in assisting in the training of men, doing post check work to establish the limits of areas to be eliminated from crew work and in checking the efficiency of the eradication work.

The CCC crew in Stevens Canyon was engaged entirely in second working while the regular crews at Longmire and White River were engaged on both second and third working. The work as programmed was not completed on any of the areas due to a late start with regular funds, much interference from rain on the Longmire area and some hindrance because of forest fires.

At the close of the ribes eradication season the regular crew was assigned to canker elimination work on the Sunrise portion of the White River area. While this cannot be considered as an alternative for ribes eradication, it is felt that much benefit is derived, since the local source of aeciospores is greatly reduced. The work done on the White River area covered the worst infection centers and prevented the unsightly appearance of dead branches without materially hindering tree growth. During the course of this work 776 acres were covered in 247 effective man-days with 21,084 cankers removed from 4,991 trees. It was necessary to remove only four trees because of killing cankers.

A representative of the Bureau of Entomology and Plant Quarantine helped plan and supervise the work. This Bureau also supplied the necessary forms and office supplies for the proper recording and reporting of data. The Chief Ranger was placed in charge of all blister rust work within the park by the Superintendent and this greatly facilitated the more orderly and efficient organization and progress of the program.

For the 1942 season the minimum requirements would be a crew of at least 20 men to spend half of the season doing urgent rework on the White River area and half of the season doing equally urgent rework on the Longmire area. If it is decided to continue rework in the Stevens Canyon area at least 35 additional men will be needed for the entire season.

The following tables show statements of expenditures, results of the field work for 1941, and accumulative results for all work done to date:

### TABLE 1

### EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941 MOUNT RAINIER NATIONAL PARK

Cooperating Agency	Appropriation	Amount
National	Regular	\$8,780.63
Park Service	Total	8,780.63
Bureau of Entomology	Regular	829.93
and	WashLRA	82.00
Plant Quarantine	Total	911.93
All Agencies	Total	\$9,692.56

### TABLE LA

### CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941 MOUNT RAINIER NATIONAL PARK

	National Park	Bureau	of Ente	omology	
	Service	and Pla	ant Qua:	rantine	
Item	Regular	Regular	ERA	Total	Total
Sal. perm. men		₿825.00		\$825.00	\$ 825.00
Sal. temp. men	\$1,525.00				1,525.00
Wages, temp. labs.	6,530.55				6,530.55
Equipment	359.07				359.07
Travel and transp.	48.71	2.58	\$82.00	84.58	133.29
Other supplies	317.30	2.35		2.35	319.65
Total	\$8,780.63	\$829.93	\$82.00	\$911.93	\$9,692.56

# SUMMARY OF RIBES ERADICATION, 1941 MOUNT RAINIER NATIONAL PARK

							Ribes by	Ribes by Species					
				Effective	Ribes	Ribes	Ribes	Ribes	Ribes	Ribes		Per Acre Basis	Basis
Area	Working	Eradication Type Acres	Acres	Man-Days	lacustre	Lacustre viscosissimum bracteosum	bracteosum	watsonianum laxiflorum acerifolium	laxiflorum	acerifolium	Total	Total Man-Days Ribes	Ribes
Stevens Canyon Second	Second	Stream	42	404	18		30,432				30,450	9.61	725
		Open Reproduction		66	7,819		245		15	257	8,336	2.36	198
Longmire	Third	Stream	96	246	6,168		5,389			46	11,603	2.56	121
		All Types	138	345	13,987		5,634		15	303	19,939	2.50	144
	Second	Open Pole	280	195		7		15	129	4,504	4,655	.70	17
White River Third	Third	Open Pole	959	629	860	2,556		10,274	0%	557	14,267	.67	15
	All Workings Open Pole	Open Pole	1,239	834	860	2,563		10,289	149	5,061	18,922	.67	15
		Open Pole	280	195		4		15	129	4,504	4,655	.70	17
	Second	Stream	42		18		30,432				30,450	9.61	725
		All Types	322	599	18	4	30,432	15	129	4,504	35,105	1.86	109
		Open Reproduction	_		7,819		245		15	257	8,336	2.36	198
		Open Pole	959		860	2,556		10,274	20	557	14,267	.67	15
	Third	All Upland	1,001		8,679	2,556	245	10,274	35	814	22,603	-74	23
All Areas		Stream	96		6,168		5,389			46	11,603	2.56	121
		Ali Types	1,097	On I	14,847	2,556	5,634	10,274	35	860	34,206	06°	31
		Open Reproduction	_	66	7,819		245		15	257	8,336	2.36	198
		Open Pole	1,239		860	2,563		10,289	149	5,061	18,922	.67	15
	All Workings	All Upland	1,281		8,679	2,563	245	10,289	164	5,318	27,258	.73	21
		Stream	138	Н	6,186		35,821			46	42,053	4.71	305
		All Types	1,419	1,583	14,865	2,563	36,066	10,289	164	5.364	69.311	1.12	49

TABLE 3

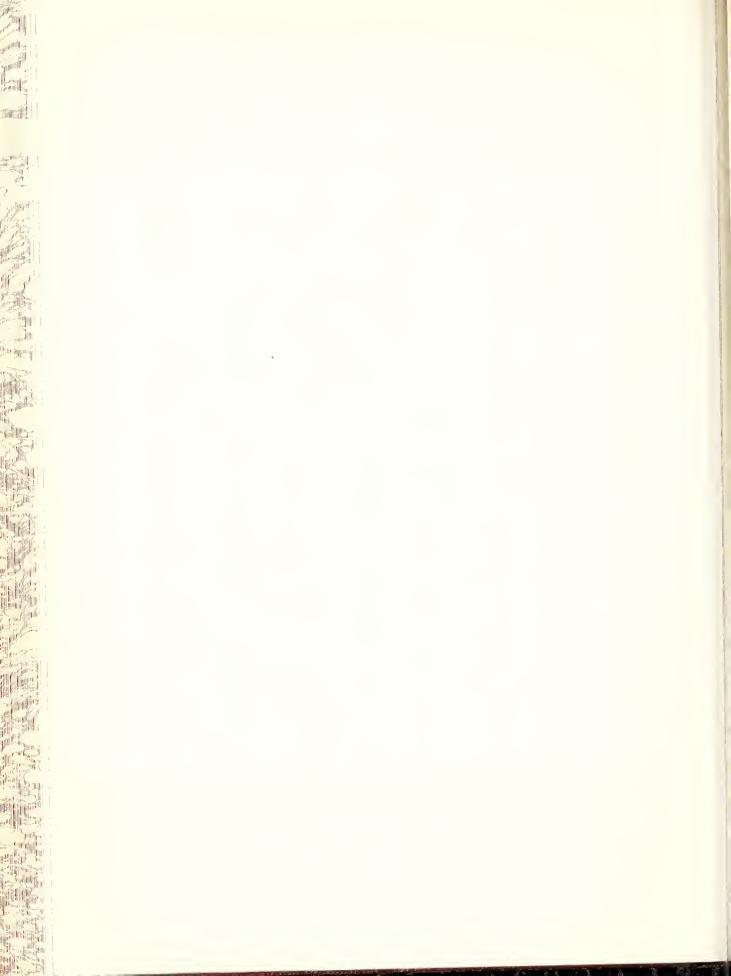
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1930-1941 MOUNT RAINIER NATIONAL PARK

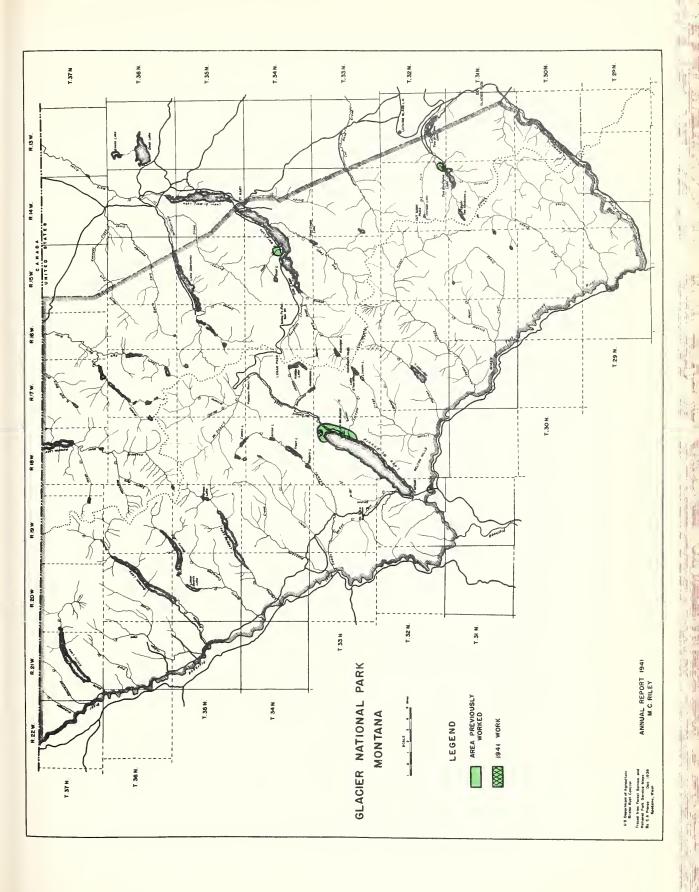
			Effective	Total	Per Acre	Basis
Working	Class	Acres	Man-Days	Ribes	Man-Days	Ribes
	NP-Reg.	2,647	3,806	780,171	1.44	295
First	NP-CCC	5,607	6,264	860,336	1.12	154
	Total	8,254	10,070	1,640,507	1.22	199
	NP-Reg.	318	267	14,310	.84	45
Second	NP-CCC	4,262	5,372	381,518	1.26	90
	Total	4,580	5,639	395,828	1.23	86
	NP-Reg.	1,097	984	34,206	06.	31
Third	NP-CCC	1,091	1,056	51,313	.97	47
	Total	2,188	2,040	85,519	.93	39
ווס	NP-Reg.	4,062	5,057	828,687	1.24	204
Montingo	NP-CCC	10,960	12,692	1,293,167	1.16	118
BOT PTINGS	Total	15.022	17.749	2.121 R54	al l	141

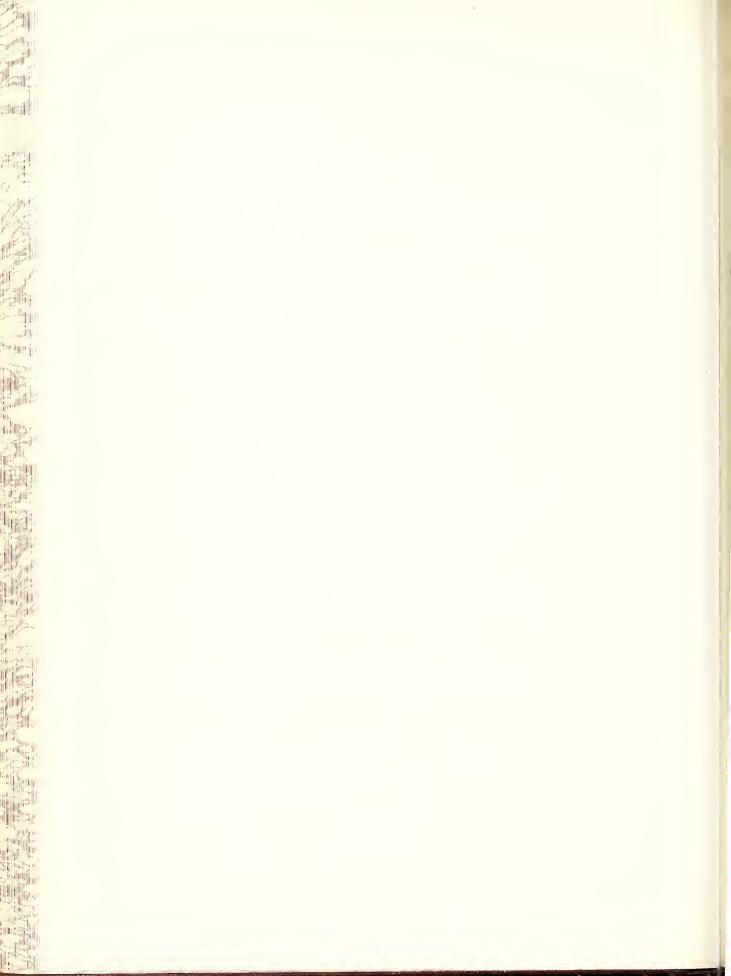


TABLE 4 SUMMARY OF RIBES ERADICATION, 1930-1941 MOUNT RAINIER MATIONAL PARK

Provide   Area																
Triple   Arma			•		Effective	Ribee	Pihos	Pihee	Ribes by S	peciee	Ribee	Ribee	Ribes	Total	Per Acre	Baele
Longster   Street	Working	Area	Eradication Type	Acree												
Second   S			Open Reproduction					1,101		5,409	5,804			52,595	1.45	
Parene Catyon   Parene Catyo		Longmire						97,774		53,899	2,838			340,214	1,92	543
Serone Casys				2 351						59,308	8,642				1.73	
Serious Cargon Lair Unitaria				704	38	176		1,052							.05	2
First    First		Stevene Canyon		3,055	256			17,038						53,216		
Piret Piret    Part   Piret				1,192	4,741	72,360	2,055	440,386			11	3,959		519,685	3,98	135
First    Print			Open Reproduction		50	6,869			1,133			11,050		9,006	. 76	
Pireta								539	139,238			91	744	395,911	1.12	
Pireta		White River	All Imland	322		27,327	12,847	560	140 371	3 744		91	744	40,224	1.06	125
## All Types   All Types   2,611   3,163   370,263   91,155   5,429   140,513   10,646   11,225   130   752   520,763   117   520   520,763   117   520   520,763   117   520   520,763   117   520   520,763   117   520   520   11,544   5,148   5,729   3,221   16,785   5   6,539   77   128   127   128   127   128   127   128   127   128   127   128   127   128   127   128   127   128	First		Stream			162,856	1,510			8,820	188	98	. 8	178,591	1,76	422
Starbo							84,125	5,429	140,613	10,564	11,328	189	752			
Become			Open Heproduction			11 276				3 221	2,305			2,387	. 44	
Become		Starbo	All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	132
All Arose   Company   Co							575		476	546				4,669	1,00	102
## All Arose   Park   2,906   2,307   195,332   75,600   1,901   145,901   4,410   27,459   107   744   41,164   82   125     Park   Park   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500     Park   Park   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500     Park   Park   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500     Park   Park   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500   1,500     Park   Park   1,500   1,								17 108	7,206	5,959		7,915	-			
## All Arose ###			Open Pole	2,906	2,387	185,232	75,660		145,961	4,410	27,459		744	441.164	. 82	152
All Types   1,000		All Areae		322	264	27,327	12,847		146 133	5	45	5 000	611	40,224	.82	
All Types   1,000				2 287	6 733	287,848	88,753	18,699	147,101	10,374	35,807	8,022		1 043 159	2 94	
Comparison   Com			All Types	8,254	10,070	711,414	92,893	561,728	147,819	74,553	39,253	12,095	752	1,640,507	1.22	199
Second   Stream   787   2,532   49,131   96   171,224   97   677   221,067   3,22   281,18   35								1,101								
Second   Stream   787   2,532   49,131   96   171,224   97   677   221,067   3,22   281,18   35		Longmire	All Types	614	526							50				
Part   Brito   Brown   Part		Stevene Canyon	Stream		2,532	49,131	95	171,224		2,034	1,420			221,057		
Part   Brite   Part			Open Reproduction			221								298	.18	
## All Areas						1.278	2 011	2,176	5,864	16,224	4,537					
## All Areas	0	White Biver	All Upland	2,582	1,827	37,783	16,315	2,176	6,941	16,224	4,537			83,976		
All Areas    Page Reproduction   269   109   9,965   1,101   77	Second		Stream	394		32.748		154		5				32,907	1.67	84_
## All Area   Open Fole							16,315	1,101		16,229	4,557	-				
Stream			Open Pole	2,194	1,768	36,284	14,304	2,176		16,224	4,537			80,389	. 81	37
Stream		All Areae	Open Mature	322		1,278	2,011	7 070	6 043	3.6 004	4 525					10
Longsire   All Types   4,580   5,639   149,363   16,410   197,851   5,941   15,623   5,963   657   335,828   1,23   86							95	194.574	0,941	2.399	1,426	657		301.007	2.07	
Longmire   Stream   489   472   15,619   6,582   316   46   6   22,549   97   46   6   8   8   100   85   100   85   100   86   10			All Types	4,580	5,639	149,383		197,851	6,941	18,623	5,963	657		395,828	1.23	86
Stevens Cargon   Stream   220   551   571   23,438   6,607   331   303   6   30,885   1,08   58		Tanantan														
## Pite River   Stevens   Canyon   Stream   220   551   712   23,384     24,996   2,50   110, 277   20   557   14,267   67   15   15   15   15   15   15   15   1			All Types		571			6,807		331				30,885	1.08	58
Third    Phite River   Stream		Stevens Canyon	Stream			712		23,384						24,096		
All Area   All Area	m. 4 . 3	White River		959 478	279	13.281		34	10,274		557		-	14,267		
All Area   Open Reproduction   42   99   7,819   245   10,274   20   557   8,336   2,36   198   All Area   All	Third	WALCO MITTO	All Types		918	14,141	4,809		10,274	723	557			30,538		21
Stream   1,187   1,392   23,612   2,253   29,980   1,019   46   6   62,916   1,10   55   141   17pes   2,188   2,040   36,291   4,809   30,225   10,274   1,054   860   6   85,519   93   39   30,225   10,274   1,054   860   6   85,519   93   39   30,225   10,274   1,054   860   6   85,519   93   39   30,225   10,274   1,054   860   6   85,519   93   39   30,225   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054			Open Reproduction				0.550	245	10.074					8,336	2,36	
Stream   1,187   1,392   23,612   2,253   29,980   1,019   46   6   62,916   1,10   55   141   17pes   2,188   2,040   36,291   4,809   30,225   10,274   1,054   860   6   85,519   93   39   30,225   10,274   1,054   860   6   85,519   93   39   30,225   10,274   1,054   860   6   85,519   93   39   30,225   10,274   1,054   860   6   85,519   93   39   30,225   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054   1,052   1,054		All Arese	AII Upland	1.001	738	8,679	2,556	245	10,274		814		-	22,603		23
All Types   2,188   2,040   38,291   4,809   30,225   10,274   1,054   860   6   85,519   9,3   39			Stream	1,187	1,302	29,612	2,253	29,980		1.019	46	6.		62,916	1,10	53_
Longaire   Stream   1,729   2,200   221,283   127,532   56,609   4,310   72   409,805   1,27   237			Onen Remroducation	2,188		38,291	4,809	30,225	10,274	1,054		6		85,519		
Stevens Canyon   Types   2,248   2,793   279,127   129,979   62,033   10,371   72   481,582   1,24   214		Longmire	Stream	1,729	2,200	221,283		127,532		56,609	4,310			409.806	1,14	
Stevens Canyon   All Upland   3,055   255   28,247   17,058   7,931   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   553,246   0,98   17,331   1,10   1				2,248	2,793	279,127		129,979		62,033	10,371			481,582	1.24	214
#Inite River   Thite River   T			Open Reproduction					15,986								
#Inite River   Thite River   T		Stevens Canyon	All Upland	3,055	256	28,247		17,038				7,931		53,216		17
#hite River   Printinge   Prin				2,199		155 503	2.150	634,994			11	4,566		764,838	3,56	
Print River   Print River			Open Reproduction	5,254					1,210			12,497		818,054		
All Torkinge    All Upland   5,799   4,867   246,619   101,486   2,736   157,586   17,988   16,134   91   744   543,384   ,84   94			Open Pole	5,023	4,494	210,924	86,389				15,895	91	744	490,567		98
Stream		White River	Open Mature	644			14,858	2 974	157 500	17 000		01	244	43,513	. 48	68
Starbo   Starbo   Starbo   Span Reproduction   48   21   68   68   7   7   3   22   305   5   271   15   3   92   109			Stream	1,295	1,680	209,985	3,763	5,057		9,528	188			227,769	1.30	
Starbo	-organie		All Types	7,094	6,547	455,504	105,249	7,793	157,828	27,516	16,322		752	771,153	, 92	109
Starbo			Open Reproduction							7 221	2,305			2,387		
Stream   46   46   2,663   575   476   546   409   4,669   1,00   102     All Types   426   329   14,007   6,713   7,206   3,767   19,372   51,065   7,7   120     Open Reproduction   3,050   894   93,073   246   18,454   1,217   5,974   8,560   7,915   135,439   2.9   44     Open Mature   644   311   28,605   14,858   3,767   163,099   20,654   32,553   107   744   535,820   7,9   88     All Areas   All Upland   9,753   5,999   344,054   107,624   22,221   164,316   26,633   41,158   8,022   744   714,772   5,2   73     Stream   5,259   11,750   555,034   6,488   767,583   718   67,637   4,918   4,736   8   1,407,082   2,23   287		Starbo	All Upland	380	283	11,344	6,138			3,221					.79	
Open Reproduction 3,050         894         93,073         246         18,454         1,217         5,974         8,560         7,915         135,439         2.9         44           Open Pole 6,059         4,794         22,376         92,520         3,787         163,099         20,654         32,553         107         744         535,820         .79         88           Open Mature         644         311         28,605         14,858         5         45         43,513         48         68           All Poland         9,753         5,999         344,054         107,624         22,221         164,316         26,633         41,158         8,022         744         714,772         52         73           Stream         5,259         11,785         55,034         6,488         767,583         718         67,597         4,918         4,735         8         11,407,082         2,23         287			Stream	46	46	2,663	575		476	546	409				1,00	
Open Pole         6,059         4,794         222,376         92,520         3,767         163,099         20,654         32,553         107         744         535,820         .79         88           All areas         All Upland         9,753         5,999         344,054         107,624         22,221         164,316         26,633         41,158         8,022         744         714,772         52         73           Stream         5,259         11,750         555,034         6,488         767,583         7,18         67,597         4,918         4,735         8         1,407,082         2,23         267						14,007		10 454	7,206	3,767		7 0) 6		51,065		120
All åreas         Open Neture         644         311         28,605         14,558         5         45         43,513         48         68           All Upland         9,753         5,999         244,054         107,624         22,221         164,316         26,633         41,158         8,022         744         714,772         52         73           Stream         5,259         11,750         555,034         6,488         767,583         7,18         67,597         4,918         4,735         8         11,407,082         2,23         267			Open Pole					3,767					744			
Stream 5,269 11,750 555,034 6,488 767,583 718 67,597 4,918 4,735 8 1,407,082 2,23 267		A11 4 PAGE	Open Mature	644	311	28,605	14,858			5	45			43,513		68
All Typee 15,022 17,749 899,088 114,112 789,804 165,034 94,230 46,076 12,758 752   2,121,854 1,18 141		MAY WIGHT				344,054	107,624	22.221	164,316	26,633	41,158				2 23	







## BLISTER RUST CONTROL WORK, GLACIER NATIONAL PARK, 1941 By M. C. Riley Associate Forester

Ribes eradication for the control of white pine blister rust on Glacier National Park during the 1941 field season was a continuation, on a very small scale, of the work started during 1939.

Accomplishments were far short of the planned program for the season due to the reduction in the number of CCC camps in the park, lack of enrollees in the camps that were occupied, and because none of the regular funds were made available to this park. No checker was employed this season since the small amount of work done would not justify the expense. The area worked was given a random inspection by qualified men.

Infected white pine were found for the first time on Glacier National Park. The infection consisted of a total of six cankers on three suppressed western white pine north of the road which extends around the head of Lake McDonald. None of the cankers had reached the fruiting stage. Although considerable scouting was done in the immediate vicinity, no other infected trees were found. Because the majority of trees on the area are difficult to inspect due to their height, it is quite possible that more infection exists here than was found. White pine and ribes were examined on all of the other areas in the park where ribes eradication work has been started but no other infection was found.

The only blister rust control work done in the park this season was accomplished by CCC enrollees from one of the camps located at Belton and was a continuation of the first working program started on this area in 1939. Initial ribes eradication has not as yet been completed here. Approximately 25 enrollees were used for about three weeks in June under the supervision of an experienced blister rust foreman.

At the suggestion of Park Service officials the names of two of the areas have been changed. Hereafter the area formerly called Belton will be known as the Park Headquarters Area, and Roes Creek will be known as the East Glacier Area.

In connection with the blister rust control work in Glacier National Park during the 1941 field season, the Eureau of Entomology and Plant Quarantine expended \$470.27 for salaries, travel and supervisory time.

### RECOMMENDATIONS

Since initial ribes eradication has been completed on only one of the four areas it is imperative that positive action be taken during 1942 in order to realize the advantage of work already done. In addition to furnishing the initial working on the selected areas, there is now considerable rework needed on every area and in some cases this phase of the program is at least one year behind schedule. On none of the areas where work has been started is it considered that the complete acreage is on a maintenance basis.

### RESULTS

The following tables show the results of the ribes eradication work for the 1941 field season and accumulative totals for all work done to date:

Paris and the second

TABLE 1

SUMMARY OF RIBES ERADICATION, 1941
GLACIER NATIONAL PARK

					ibes by Species				
	Eradication		Effective		Ribes			Per Acre	
Area	Туре	Acres	Man-Days	lacustre	viscosissimum	setosum	Ribes	Man-Days	Ribes
Lake	Open Mature	54	34	154	347	360	861	.63	16
McDonald	Stream	6	17	553		1,602	2,155	2.83	359
меропата	All Types	60	51	707	347	1,962	3,016	.85	50

TABLE 2

SUMMARY OF RIBES ERADICATION, 1939-1941
GLACIER NATIONAL PARK

					Ribes by Spe	ecies				
			Effective	Ribes	Ribes	Ribes	Ribes	Total	Per Acre	Rasis
Area	Eradication Type	Acres	1		viscosissimum		inerme	Ribes	Man-Days	
11200	and and an angle		and says	14045010	V100001001mm	000000	Inormo	111000	adn bayb	112000
	Open Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
Park	Open Pole	284	122	13,428	15,364	8,967		37,759	.43	133
Headquarters	Brush	39	119	9,411	21,340	8,353		39,104	3.05	1,003
	All Types	681	445	32,708	43,176	32,986		108,870	.65	160
	Open Pole	346	389	16,774	2,573	1,723	2,853	23,923	1.12	69
Two	Subalpine	60	118	3,935	1,050	4,665	1,834	11,484	1.97	191
Medicine	All Upland	406	507	20,709	3,623	6,388	4,687	35,407	1.25	87
	Stream	49	464	28,325	434		12,315	41,074	9.47	838
	All Types	455	971	49,034	4,057	6,388	17,002	76,481	2.13	168
	Open Mature	683	744	17,255		29,230		50,433	1.09	74
Lake	Dense Mature	717	140	3,192		327		3,598	. 20	5
McDonald	All Upland	1,400	884	20,447	4,027	29,557		54,031	-63	39
MoDonard	Stream	11	39	5,184	35	1,602		6,821	3.54	620
	All Types	1,411	923	25,631	4,062	31,159		60,852	.65	43
East Glacier	Open Pole	86	494	24,077	5,650		41,173	77,638	5.74	903
	Open Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
	Open Pole	716	1,005	54,279		17,428	44,026	139,320	1.40	195
	Open Mature	683	744	17,255		29,230		50,433	1.09	74
All	Dense Mature	717	140	3,192		327		3,598	.20	5
Areas	Brush	39	119	9,411	21,340	8,353		39,104	3.05	1,003
	Subalpine	60	118	3,935		4,665	1,834	11,484	1.97	191
	All Upland	2,573	2,330	97,941	56,476			275,946	.91	107
	Stream	60	503	33,509			12,315		8.38	798
	All Types	2,633	2,833	131,450	56,945	77,271	58,175	323,841	1.08	123



### SCOUTING FOR BLISTER RUST IN YELLOWSTONE NATIONAL PARK AND ADJACENT AREAS, 1941

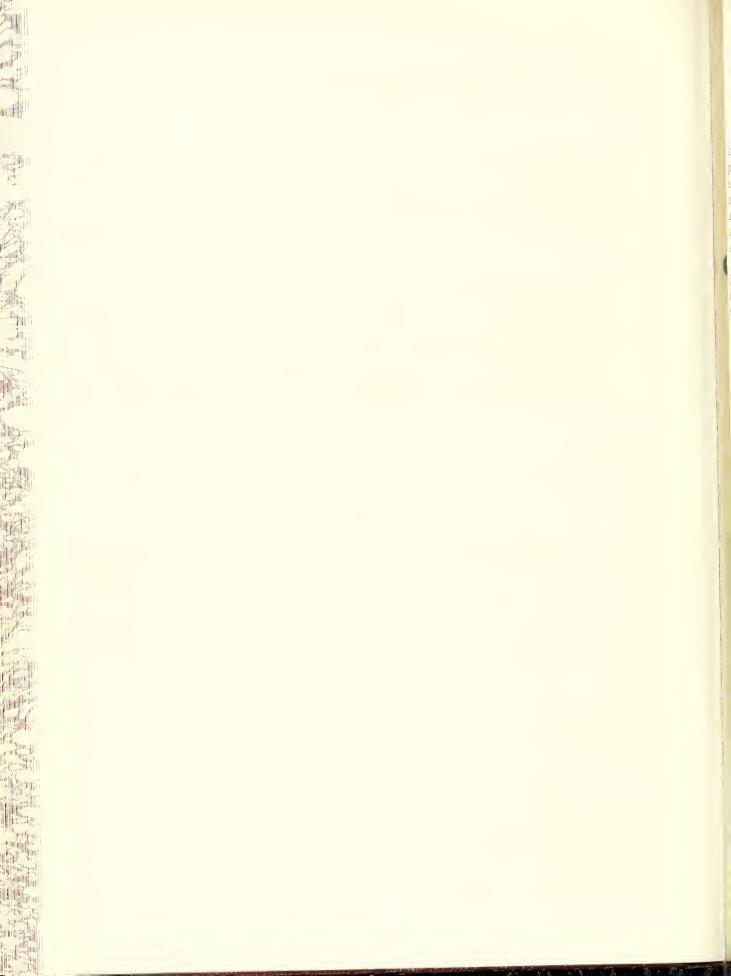
By Edward L. Joy, Forester

In order to keep a close check on the spread of blister rust into the white-bark (Pinus albicaulis), and limber pine (P. flexilis) stands of northwestern Wyoming and adjacent Montana, this general region was scouted in July and August, 1941. Major efforts were placed on areas within Yellowstone and Grand Teton National Parks in which the establishment of control on selected areas is planned for the near future. Additional scouting was performed on areas bordering the parks with special emphasis placed on National Forest lands adjacent to the northwest corner of the Yellowstone. This included careful coverage of the Bear Creek drainage on the Gallatin National Forest where ribes infection only 19 miles from the park boundary was found in 1937.

Although thousands of Ribes petiolare bushes and several hundred whitebark and limber pine trees growing in major drainages of the area were examined, no blister rust was found. This includes inspection in drainages in which solid and continuous clumps of R. petiolare and closely associated fiveneedle pines occur for distances up to several miles. In addition to this excellent association of the most susceptible species of wild ribes and pines known, moisture and wind current conditions in these drainages are particularly favorable for the development and spread of the disease.

The 1941 season of potential rust spread into this region, which probably extended from May to September, was exceptionally wet. Rains fell during much of each month with unusually heavy downpours very common. It was probably because of the extent and severity of these storms and the accompanying prevention of air-current spore dissemination over long distances that there was very little if any rust spread southeastward from the heavy north Idaho pine infection centers. This abundant precipitation could also be a deterrent to shorter distance spread such as within a drainage or between adjacent drainages but probably such local spread would not be as completely stopped since favorable periods occur between storms. The fact that no rust could be found under conditions that probably were quite favorable for local spread leads to the conclusion that centers of spore-producing pine infection are either very few in number or totally absent in the region scouted.

These results are interpreted to mean that the northwestern Wyoming and adjacent Montana forests still represent the rust invasion front with the strong likelihood that the next zone, in which rust intensification is taking place, lies to the northwest somewhere in Montana. From the fact that ribes infections were quite readily found in the Bitterroot and Wise River ranges of the Beaverhead National Forest during 1937, it is probable that these districts now harbor centers of mature pine infection and fall into this zone. If this is true, the nearest source of spores for spread to Yellowstone National Park is now less than 100 miles or only about one-half the distance from the nearest north Idaho centers.



### PREERADICATION SURVEY OF SELECTED AREAS IN GRAND TETON NATIONAL PARK, 1941

By Edward L. Joy, Forester

Grand Teton National Park was first given consideration with respect to white pine blister rust control work in 1934 when a preliminary survey of fiveneedle or white pines and ribes on forested areas in Colorado and Wyoming was made. As a result of that work this park was included as one of the forest units with white pines of considerable value as recreational and watershed area cover. The total area of land with the better stands of these pines was at that time estimated to be about 2,000 acres.

The probability of rust invasion in the northwestern Wyoming five-needle pine stands, based on the discovery of the disease nearby in 1937 and the knowledge that not many years can pass before considerable infection will result, made it advisable to plan for the early establishment of control on Grand Teton National Park areas. For this purpose a partial preeradication survey of the park areas was conducted in 1941 by technicians of the Bureau of Entomology and Plant Quarantine. Although a complete report on this work has been prepared and submitted to the National Park Service, the major points are herein recorded.

### AREAS SURVEYED

In the main, Grand Teton National Park is a wilderness area reached only by trails through deep-cut canyons, up steep, rugged slopes, and along high ridges. Consequently those areas of five-needle pines that are immediately adjacent to these trails are of primary importance and were designated for first attention. At the same time the importance of "front slope" stands, or those on the east-facing slopes which constitute the upper-elevation timber cover visible from the main highway through Jackson Hole, was sufficient to justify their inclusion for consideration. With this as a guide inspection or sample stripping to secure basic information for control estimates was accomplished for all areas designated. Due to the fact that all living accommodations are on the Jackson Hole Valley floor, travel time to the areas is considerable and unusually wet weather prevailed, it was possible to give the areas only extensive coverage in the time allowable. However sufficient data for preliminary estimates of the initial eradication or first working were secured for ten areas. Estimates on rework are not made at this time but this phase of the project for all areas will probably require at least 50 per cent of the initial working time.

The ten areas surveyed are as follows:

### Trail-Side Areas

- 1. Glacier Trail
- 2. Death Canyon-Teeter Ridge
- 3. Alaska Basin (Targhee N. F.)
- 4. South Fork of Cascade Creek
- 5. North Fork of Cascade Creek
- 6. Paintbrush Canyon Holly Lake

### Front-Slope Areas

- 1. East Horn
- 2. Paintbrush to Cascade
- 3. Cascade to Glacier
- 4. Garnet to Avalanche

### FIVE-NEEDLE PINES

Although both <u>Pinus albicaulis</u>, whitebark pine, and <u>P. flexilis</u>, limber pine, occur in the park, the former is more abundant and is the principal species of all ten areas. In the lower elevations where <u>P. flexilis</u> occurs, it is a minor associate of other conifers which together would provide an adequate timber cover without the limber pine. In the higher reaches, however, whitebark pine is the major species and constitutes the principal cover on many areas. This is indicated from the Vegetation Type survey records for the park which show 10,220 acres of whitebark pine, the largest amount in any timber type in the park.

### RIBES

At several places within Grand Teton National Park veritable ribes gardens exist. One of these is in Death Canyon on the lower edge of the Death Canyon-Teeter Ridge areas where the five major ribes species of the park are to be found. These are Ribes petiolare, western black current; R. inerme, white stemmed gooseberry; R. lacustre, prickly current; R. montigenum, alpine current; and R. viscosissimum, sticky current. Adding two additional species, R. cereum, squaw current, and R. setosum, bristly gooseberry, that grow in the lower elevations, the total ribes flora for this locality is seven species.

Par Medi

All surveyed areas support some ribes, chief of which are R. viscosissimum, R. montigenum, and R. lacustre. In general these species occur in light to medium populations with heavy patches only occasional.

#### SURVEY RESULTS

Data for the ten areas surveyed, which are summarized in table 1, are presented in two groups. The first consists of the six trail-side areas and the second, the four front-slope areas. All estimates are for regular funds operated camps.

TABLE 1
SUMMARY OF CONTROL ESTIMATES
FOR GRAND TETON NATIONAL PARK AREAS

			*Total 8-hr.
Area	Acres	Ribes Per Acre	Man-Days
Glacier Trail	400	75-100	500
Death Canyon-Teeter Ridge	600	100-125**	1,150
Alaska Basin	500	25-50	350 .
South Fork Cascade Creek	800	50-100	800
North Fork Cascade Creek	450	25-50	300
Paintbrush Canyon-holly Lake	700	50-75	700
Total Major Areas	3,450		3,800
East Horn	500	25-50	500
Paintbrush to Cascade	700	200-250	1,050
Cascade to Glacier	700	25-50	700
Garnet to Avalanche	450	25-50	450
Total Front-Slope Areas	2,350		2,700
Grand Total	5,800		6,500

<sup>\*</sup>Man-days include only the actual time to be spent on ribes removal.

<sup>\*\*</sup>Estimate for upland area only. Stream type ribes classed "Heavy".



### PINE DISEASE SURVEY AND SCOUTING FOR WHITE PINE BLISTER RUST IN THE INLAND EMPIRE, 1941

By R. L. MacLeod Associate Pathologist

#### INTRODUCTION

During the past four years pine disease survey and post check work were sometimes performed on the same area. As the pine disease survey includes the data taken on the post check it was considered advisable to combine these two types of survey on areas requiring both types during the same year. Pine disease survey work in 1941 was therefore placed under the direct supervision of the checking supervisor on each operation.

Plot study work was continued under the supervision of C. R. Stillinger.

### A. Pine Disease Survey

The results of the 1941 pine disease survey are shown by operations in table 1. Descriptions of areas covered by the survey are included in the individual operation reports.

### B. Scouting for the Rust

In the Inland Empire the year 1941 was characterized by excessive moisture throughout the field season. It was a favorable year for local rust intensification but not so favorable for long-distance spread. The longer periods of more or less continuous rain may have been unfavorable for spread but many intervening periods of high humidity were favorable for intensification. With pine infection prevalent over all of the Inland Empire white pine belt, ribes infection was general and could be located readily even in areas where ribes bushes were small and scattered.

That the year was not favorable for long distance spread particularly to the southeast, is evidenced by the fact that six man weeks of scouting in heavy Ribes petiolare areas on Yellowstone and Grand Teton National Parks Tailed to reveal the presence of the rust.

### RESULTS

The amount of work accomplished in the Inland Empire is shown by operations in table 1.

TABLE 1
PINE DISEASE SURVEY, 1941
SUMMARY BY OPERATIONS

	Miles	W	nite Pir	ne	Canl	kers
	of	Number	Infe	ected		Per 100
Operation	Strip	Examined	Number	Per Cent	Number	Trees
Clearwater	7.9	3,022	1,232	40.7	7,324	242.4
St. Joe	32.0	17,923	856	4.8	1,144	6.4
Coeur d'Alene	192.1	89,443	251	.3	273	.3
Kaniksu	82.2	74,379	4,571	6.2	*	
Total	314.2	l84,767	6,910	3 <b>.7</b>	*	

<sup>\*</sup>Data incomplete

n April

# BLISTER RUST PLOT STUDIES By C. R. Stillinger Assistant Pathologist

### INTRODUCTION

The program for obtaining information on white pine blister rust by means of permanent plot studies, as a supplement to the extensive surveys for ribes and pine distribution and infection, was continued during the 1941 field season. Besides the regular inspection of all ribes on those plots where this was part of the work program, the number of ribes on one plot was reduced. Also, plot work was started for the first time on the Kaniksu operation by the establishment of five new plots. The pertinent information which has been compiled will be given in the discussion for each plot. All data for the new plots are only tentative since they are the result of rapid initial surveys.

### BLISTER RUST CONDITIONS IN 1941

This past season undoubtedly will prove to be another very favorable year for the intensification of the rust because of the frequent rains distributed throughout the summer as well as the fact that the infection on the white pine which took place in 1937 reached its greatest volume of aecial production this year. Table 1 reveals that in 1941 more rust was present on the ribes, a higher percentage of the ribes bushes was infected and there was a greater average amount of rust per infected leaf than in 1940.

TABLE 1

COMPARISON OF AMOUNT OF RIBES INFECTION IN 1940 AND 1941

		Per (	Cent	Per	Cent	Sq.	In.
		Ril	asc	Lear	<i>i</i> es	Inf.	Per
		Infe	eted	Infe	cted	Inf.	Leaf'
Plot	Operation	1940	1941	1940	1941	1940	1941
Powder House Plot	Clearwater	43.5	50.7	18.5	17.2	.15	.17
Trail Creek Plot 6	Clearwater	32.7	77.6	6.1	24.4	.07	.06
Trail Creek Plot 3	Clearwater	27.7	50.0	0.4	0.5	.05	.07
E. Emerald Plot 18	St. Joe	50.0	100.0	1.9	18.4	.02	.05
E. Emerald Plot 19	St. Joe	100.0	100.0	49.0	61.0	.04	.06
E. Emerald Plot 20	St. Joe	67.0	100.0	6.6	22.4	.06	.41

### PERTINENT RESULTS FROM INDIVIDUAL PLOTS

### Kalispell Creek Plots 24, 25 and 26

Kalispell Creek plots 24, 25 and 26 were established during the past summer on the Kaniksu operation in a 1933 white pine planting. This area was burned in 1926 and the snags were felled and burned in 1932. Plot 24 is located in

the SE.  $\frac{1}{4}$  of the SE.  $\frac{1}{2}$  of sec. 14 and the other two in the NW.  $\frac{1}{4}$  of the NW.  $\frac{1}{4}$  of sec. 24, all in T. 36 N., R. 4 E., W.M. The general views shown in pictures W 222, W 215 and W 216 give a good idea of the conditions on each of the plots. Table 2 gives a summary of the principal facts regarding each plot as found in 1941.

TABLE 2
SUMMARY OF DATA FOR KALISPELL CREEK PLOTS 24, 25 AND 26
KANIKSU OPERATION

	Ite	ems	Plot 24	Plot 25	Plot 26
Area - A	Acres		29.7	8.7	9.6
White Pi	ine Per Act	re	222 *	357	437
Per Cent	Pines In	fected	5.7*	5.3	4.3
	Total	lacustre	16	25	85
Ribes	TOURL	viscosissimum	55	2	
	Per Acre		2.39	3.1	8.85
Feet of	Total	lacustre	229	1,277	2,171
Live	10001	viscosissimum	876	143	
Stem	Per Acre		37.2	163	227
Ribes	Per Cent 1	bushes	71.8	96	63.5
Infec-	Per Foot	Live Stem, Sq. In.	2.3	.06	.01
tion	Per Bush,	Sq. In.	3.6	3.2	.3

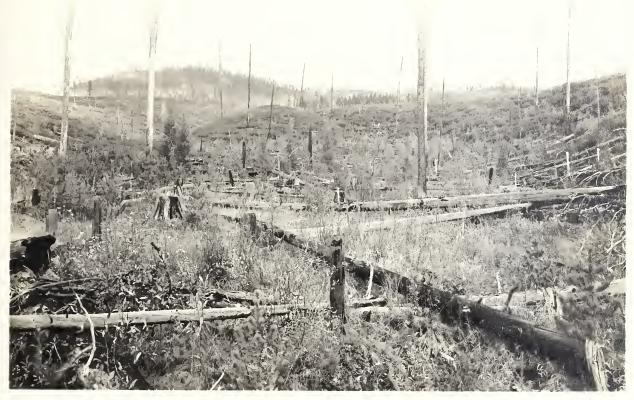
<sup>\*</sup>Pine inspected on only one acre.

The ribes are quite generally distributed over the plots except for a few concentrations. No ribes eradication has been done on the area. The rust on the pine is all of 1937 origin and is uniformly distributed over the plots with very little indication of a pattern near any particular bush. That this type of distribution appears to be quite typical for the initial spread of the rust in an area is suggested by a similar initial distribution which has been found on some of the other plots.

The purpose of these plots will be to determine the effect of a small amount of ribes and feet of live stem per acre on the increase of the rust on pine by eradicating in 1942 part of the present ribes population.

The following observations from the preliminary data for the plots are worthy of note since the rust on all of these plots originated in 1937:

- 1. The number of pines on plot 26 is 97 per cent and on plot 25, 61 per cent greater than that of plot 24.
- 2. The per cent of pine infection on plot 26 is 75 per cent and on plot 25, 93 per cent of that of plot 24. In other words the amount of pine infection is not in proportion to the target.
- 3. The ribes per acre on plot 26 are 370 per cent and on plot 25, 130 per cent of those on plot 24. However, the increase in the number of ribes



W 222. Kalispell Creek plot 24. West half of the plot looking north. The flat area in the center of the picture is largely free from brush while the hillsides are covered with <u>Ceanothus velutinus</u>. Area planted to white pine 1933. White stakes mark location of individual ribes bushes.



W 215. Kalispell Creek plot 25. Fast half of plot. This is a north facing slope. The pine, planted in 1933, are distributed among natural reproduction of larch, white fir and aspens with very little underbrush.



per acre has not produced a corresponding increase in the amount of infection. In this connection it should be noted that plot 26 is entirely  $\underline{R}$ . lacustre, plot 25 is almost all  $\underline{R}$ . lacustre, while plot 24 is 77 per cent  $\underline{R}$ . viscosissimum.

- 4. There does not appear to be any correlation between the ribes feet of live stem per acre and the rust on the ribes based on the amount of rust per foot of live stem.
- 5. There is some correlation between the number of ribes per acre and amount of rust present on plots 24 and 25 but not plot 26.

### Kalispell Creek Plot 27

Kalispell Creek plot 27 was established this year on the Kaniksu operation in T. 36 N., R. 45 E., sec. 11 on the broad level bench just east of Diamond Peak in a dense natural reproduction stand of white pine with a considerable snag and pole overstory (Picture W 228). The purpose of this plot will be to study the rate of increase and distance of spread of the rust from 11 R. viscosissimum bushes of various sizes with different amounts of rust infection present around each bush. The bushes were selected previous to the eradication work done on the area in 1941, hence the area surrounding each bush should be free from ribes.

### Reynolds Creek Plot 28

Reynolds Creek plot 23 was established on the Kaniksu operation on Reynolds Creek, in sec. 13, T. 60 N., R. 5 W., about a quarter mile southwest of the Kaniksu blister rust headquarters on Kalispell Bay. Reynolds Creek is a very small creek running through a small ravine. Yellow pine has been planted on the west side on a level bench about 50 feet above the stream and white pine on the east side on a rather steep west facing slope. Since these planted areas appear to be ribes-free and since an occasional R. lacustre was found along the stream, the situation represents an opportunity to study the uphill spread of blister rust from the R. lacustre in the stream bottom. Strip surveys in the white pine indicate that at present there is very little infection in the pine. Since the pine were planted in 1933 they are large enough so that damage to the pine from the study can be prevented. Seventeen ribes bushes were staked for the study.

### Powder House Plot

The Powder House plot, located on the Clearwater operation, consists of approximately 95 acres of natural reproduction averaging about 12 years of age. About 250 ribes per acre were eradicated from this general area in 1933. A thorough examination of the area in 1939 and 1940 revealed an average of 1.74 ribes with 31 feet of live stem per acre. In 1940, some of the ribes without regard to species were eradicated, with the intention of eliminating all concentrations, as well as closely associated bushes. As a result the ribes are somewhat uniformly distributed over the area with an average of 0.73 bushes with 15 feet of live stem per acre.

During July a careful search for ribes was made by crews provided by the Clearwater operation in a zone approximately five chains in width around the plot. Thirty-four R. viscosissimum, 12 R. lacustre and 4 R. petiolare were eradicated, the total averaging 0.5 ribes with 8 feet of live stem per acre. A considerable concentration was found on the north side of the plot while on the other sides, with one exception, only scattered bushes were found.

During August, 1941, all ribes on the plot were inspected. The results of this inspection, together with similar data for the same bushes in 1940, are given in table 3. From the totals for this plot the following points are of interest:

- 1. Although only half the bushes were infected this is seven per cent more than were infected in 1940.
- 2. There was an increase from 1940 to 1941 of approximately 100 feet in total live stem or approximately seven per cent.
- 3. The data for dead stem for the two years are not comparable. In 1940, only the dead part of main stems and branches were measured. In order to make the dead stem data more accurate, all such stem, including small spurs, was pruned off of each bush in 1941. Considering the figures for 1941 approximately five per cent of the live stem accumulated during the life of these ribes has died.
- 4. In 1941 there were seven per cent less leaves infected, ten per cent less rust per foot of live stem, but 13 per cent more rust per leaf than in 1940. These results indicate less aecial infection but more intensification on the infected leaves than occurred in 1940.

TABLE 3

### SUMMARY OF RIBES INFECTION DATA POWDER HOUSE PLOT, CLEARWATER OPERATION, 1940-1941

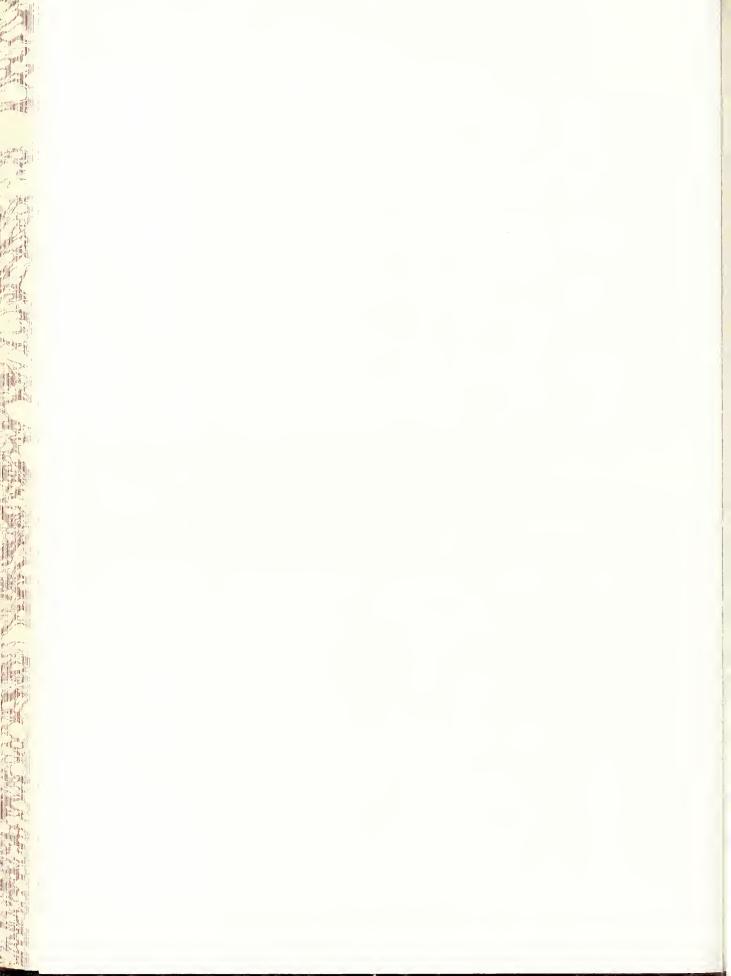
	Bush	nes	Feet	of Ster	n		Leave	5	Infect	ion - Sq.	In.
Year	Total	No.		Current		Total	No.	Per Cent		Per Inf.	Per
Insp.	No.	Inf.	Live	Year	Dead	No.	Int'.	Infected	Total	Leaf	FLS
					Ribes	lacust	re				
1940	15	6	233.4	52.5	65.2	4,936	402	8.1	24,57	.06	.11
1941	15	11	266.3	68.3	105.1	4,240	585	13.8	36.19	.06	.14
				Ril	oes vis	scosiss:	imum				
1940	51	21	1,214.6	260.1	299.9	11,271	2,532	22.5	383.97	.15	.32
1941	51	22	1,282.8	344.3	703.8	10,458	1,941	18.6	386.11	.20	.30
				ŀ	libes ≀	petiolar	re				
1940	3	3	9.1	1.5	2.3	91	86	94.5	44.42	.52	4.88
1941	3	2	7.3	1.0	6.6	83	11	13.3	8.17	,74	1.12
					All S	Species					
1940	69	30	1,457.1	314.1	367.4	16,298	3,020	18.5	452.96	.15	.31
1941	69	35	1,556.4	413.6	815.5	14,781	2,537	17.2	430.47	.17	.28
	-	New F	Ribes Rec	orded Fi	rst Ti	me 1941	L (Ribe	s viscosi	issimum	)	
1941	1	1	2.0	0.8	0.5	31	3	9.7	0.10	.33	.05



W 216. Kalispell Creek plot 26. A general view of the south half of the plot looking northwest. A small stream runs through the center of the plot. The white stakes mark the locations of individual Ribes lacustre bushes. The larger trees evident on the hillside are native larch.



W 228. Kalispell Creek plot 27 is located in the residual stand on the level bench shown in the center of the picture. The foreground has been snagged, burned and planted to white pine while the reproduction beneath the overstory is dense natural white pine.



### Trail Creek Plot 6

Trail Creek plot 6 is located on the Clearwater operation about seven miles north of Pierce, Idaho. The area on which the ribes are located is 1.6 acres in size and is well-stocked with white pine averaging 11 years of age. In continuation of the work plan all of the R. lacustre were inspected. After this inspection it was planned to reduce the number of ribes on this plot but due to the almost continuous rainy period which developed this was not done because of the probability that some infection had already taken place from the ribes.

The results of this inspection are given in table 4. A similar analysis for the ribes inspection for 1940 was given in table 2 in the 1940 report. Comparing the data for the two years some of the items of note are as follows:

- 1. The height classification of the bushes reveals that nearly 50 per cent of the bushes were six inches or less and 83 per cent 12 inches or less in height, yet all were old bushes.
- 2. This year 77.6 per cent of the ribes were infected as compared with 32.7 per cent in 1940.
- 3. The distribution of the ribes in the live stem classes remained approximately the same as last year.
- 4. The per cent of bushes infected in each class decreased with the decrease in height and in live stem.
- 5. The per cent of leaves infected and the square inch infection per foot of live stem remained somewhat the same for ribes up to five feet of live stem but decreased as bushes became larger.
- 6. The 1941 growth in inches per foot of live stem shows a remarkable uniformity in all classes.
- 7. The relation between feet of live stem and amount of rust developed this year is more nearly correlated than last year. This is to be expected because of the extremely moist summer. For example in the class with six inches or less of live stem, which accounts for 35.3 per cent of all bushes, there were 6.1 per cent of the live stem, 7.2 per cent or the leaves and 3.6 of the total rust.
- 8. The amount of the rust developed in 1941 was 3.48 times that present in 1940.

TABLE 4

SUMMARY OF DATA FOR RIBES LACUSTRE BY HEIGHT AND LIVE STEM CLASSES TRAIL CREEK PLOT 6, CLEARWATER OPERATION 1941

					)	Classes	in Inches	hes					Total or
	9-0	7-12	7-12 13-18	19-24	25-36	37-48	37-48 49-60   61-72   73-84	61-72	73-84	95-38	97-108	97-108 109-over	Average
						Height	t Classes	es					
No. Ribes	249	168	60	19	5								501*
% of Tot.	49.7 33.5	33.5	12.0	3.8	1.0								100
% Inf. of Tot.	33.9	28.2	11.1	3.6	8.								9.77
% Inf. of Class 68.0  83.9	68.0	83.9	94.7	66.7	100.0								97.6
						Live St	Stem Classes	ses					
No. Ribes	177	108	60	41	38	23	12	13	9	5	4	14	501*
% of Tot.	35.3	21.5	12.0	8.2	7.6	4.6	2.4	2.6	1.2	1.0	8.	2.8	100
% Inf. of Tot.	22.0	17.2	10.6	7.2	7.0	4.4	2.4	1.8	1.2	1.0	4.	5.6	77.6
% Inf. of Class 62.1	_	9.62	88.3	8.78	92.1	95.7	100.0	69.2	100.0	100.0	50.0	92.9	77.6
% of Tot. L. S.	6.1	9.1	8.6	8.1	10.6	9.0	0.9	7.9	4.4	4.2	3.7	22.3	100
% of Tot. Lvs.	7.2	8.8	8.5	7.1	9.3	7.3	6.1	7.4	3.8	3.7	4.0	26.3	100
% Inf. of													
Tot. Lvs.	2.0	2.8	2.7	2.0	2.5	2.6	2.0	1.1	6.	6.	.7	4.2	24.4
% Inf. in Class 28.0		31.6	32.0	27.9	27.3	35.2	32.5	14.1	24.4	25.1	17.2	15.7	24.4
% of Tot.													
Sq. In. of Inf.	8.6	15.4	11.4	10.2	14.2	13.5	7.9	3.3	3.0	2.5	æ	11.2	100
Sq. In. Inf.													
Per F. L. S.	.39	.41	.37	.35	.37	.42	.37	.12	.19	. 23	90.	.14	. 28
In. 1941 Growth													(Average)
Per F. L. S.	3.2	3.4	3.9	3.2	3.2	3.0	3.2	3.7	3.5	3.2	2.1	3.5	3.3

\*Last years report showed 507 bushes. This difference is due to dead bushes or bushes not found.

### East Emerald Creek Plot 21

East Emerald Creek plot 21 is located in the SW.  $\frac{1}{4}$  of the SW.  $\frac{1}{4}$  of sec. 8, T. 42 N., R. 1 E., on the St. Joe operation. This 1.6 acre plot is on a 50 per cent north slope. The well-stocked white pine reproduction is approximately 12 years of age. In 1938 the inspection of all white pine on the plot revealed 56 per cent infection with white pine plister rust.

Ribes eradicated from this area in 1935 totaled 181 R. lacustre, 76 R. viscosissimum and 1 R. petiolare per acre. In reeradicating the ribes up to the edge of the plot in 1940, 98 R. lacustre, 17 R. viscosissimum and 1 R. petiolare per acre were removed.

A thorough check of the plot area for ribes was made in 1940 and all ribes found were staked and numbered. In 1941 the first complete inspection of all the ribes was made. After this inspection all ribes that were over one foot high or had more than 18 inches of live stem, except a few isolated bushes, were eradicated. This standard of eradication was decided upon since an examination of the checking records for several areas in the vicinity of the plot that were worked in 1940 indicated that bushes of the smaller sizes were the ones which the eradication crews were missing.

In table 5 is given an analysis of all the data secured in 1941 for the ribes on the plot. The ribes are classified into live stem classes and whether eradicated this year or left on the plot. The following points of interest are evident from the data:

- 1. Although only 36.6 per cent of the bushes were eradicated, approximately three-fourths of the live stem and leaves, two-thirds of the infected leaves, and 61.4 per cent of the infection were removed.
- 2. The ribes were reduced from 704 to 448 per acre or 36.6 per cent and the live stem from 1,282 to 343 feet per acre or 73 per cent.
- 3. The square inches of infection per foot of live stem are much greater on bushes in the 0-12 inch live stem class than in any of the other classes, but the amount of infection per bush increases with the increase in size classes.
- 4. The average increase in growth from 1940 to 1941 was 3.53 inches per foot of live stem or 29 per cent.
- 5. The dead stem data are cumulative in that they represent all dead stem found intact in 1941 which has accumulated during the life of the ribes population. In other words, approximately 20 per cent of all live stem produced by 1941 had died. Since this dead stem was all removed in 1941 succeeding inspections will give a better idea of the relation between the development of new growth and the death of old stem. Comparing the percentages for dead stem and live stem increases suggests that the live stem is increasing about nine per cent per year.

TABLE 5

SUMMARY OF DATA FOR ALL RIBES LACUSTRE BY LIVE STEM CLASSES EAST EMERALD CREEK PLOT 21, ST. JOE OPERATION, 1941

						Ribe	s Clas	ses by	Ribes Classes by Inches of Live Stem	of Live	Stem				
		9-0	9-	7-12		13-	13-18	19-	19-24	25-36	36	37.	37-48	49	49-60
		Total	Total Erad.	Total	Erad.	Total	Frad.	Total	Erad.	Tota1	Erad.	Total	Erad.	Total	Erad.
No. Ri	Ribes	265	11	303	4	186	22	101	77	116	110	19	09	29	29
No. II	No. Inf. Ribes	223	2	285	2	177	23	98	92	112	106	09	59	29	29
Ft. L. S.	S.	92.8	1.6	236.3	2.7	238.6	72.9	177.3	136.7	289.4	274.7	214.00	214.00 210.6	129.8	129.8
Ft. G	Ft. Growth 1941 20.5	20.5	.1	42.9	2.	42.0	11.6	37.5	29.1	61.4	58.3	49.9	49.3	32.7	35.7
In. G	In. Growth 1941														
Per F	Per Ft. L. S.	3.40		2.66		2.56		3.22		3.23		3.65		4.03	
Dead Stem	Stem	37.0 37.0	37.0	53.8	53.8	45.3	45.3	49.3	49.3	103.6	103.6	52.6	52.6	24.1	24.1
No. Leaves	saves	1,413	12	2,795	23	2,505	740	2,057	1,634	3,747	3,565	2,746	2,698	1,634	1,634
No. II	No. Inf. Leaves	816	4	1,598	16	1,319	430	1,029	828	1,693	1,608	1,139	1,136	789	789
Tot.I	Tot. Inf., Sq. In.	69.17	,12	111.01	1.28	90.79	32.75	68.53	55.17	102.78	96.36	63.68	63.59	44.99	44.99
Sq. In	Sq. In. Inf.														
Per F	Per Ft. L. S.	.75		.47		.38		.39		.36		.30		. 35	
Sq. In	Sq. In. Inf.														
Per Bush	nsh	.26		.37		.49		. 68		.89		1.04		1.55	

				Ribes	Classe	s by	Inches	ibes Classes by Inches of Live Stem	re Sten	ŭ			Eradicated	ated
		-19	61-72	73-	73-84	95-	95-36	97-108	108	109-plus	olus	Grand		Per
	H	otal	Total Erad.	Total	Erad.	Total	Erad.		Total Erad.	Total	Erad.	Total	Number	Cent
No. Ribes		17	17	10	10	4	7	7	7	25	25	1,127	412	56.6
No. Inf. Ribes	sec	17	17	10	10	4	4	7	2	25	25	1,050	394	57.5
Ft. L. S.	6	92.9	92.9	63.7	63.7	51.7	51.7	60.8	8.09	371.8	371.8	2,019.1	1,469.9	72.8
Ft. Growth 1941 20.2	1941 2	0.2	20.2	12.5	12.5	9.3	9.3	13.0	13.0	117.5	117.5	459.4	353.8	77.0
In. Growth 1941	1941													
Per Ft. L. S.		3.33		2.93		2.62		3.27		5.43		3.53		
Dead Stem	3	0.1	30.1   30.1	12.0	12.0	13.2	13.2	81.8	21.8	51.1	51.1	493.9	493.9	100.0
No. Leaves	1	960,	1,096 1,096		,022 1,022	719	913	885	885	6,131	6,131	26,750	20,159	75.4
No. Inf. Leaves	aves	446	446	170	170	154	154	282	282	1,277	1,277	10,712	7,150	66.8
Tot. Inf., Sq. In.   26.96   26.96	In. 2	6.96	26.96	4.96	4.96	6.28	6.28	8.46	8.46	60.25	60.25	657,80	404.17	61.4
Sq. In. Inf.														
Per Ft. L. S.	3.	.29		.08		.12		.14		.16		.33		
Sq. In. Inf													*****	
Per Bush		1.59		.50		06.		67		2.41		.58		



W 234. Approximately one-half natural size. Types of regenerated Ribes lacustre roots eradicated in 1941 from East Emerald Creek plot 21. The peculiar curved crowns of 1,  $\frac{2}{2}$  and  $\frac{3}{3}$  show how the tops may be broken off if leverage is applied at the stem tips. No. 4 is a three-inch stem which regenerated either due to rooting before the ends were broken or covering during eradication. Bush details are as follows: No. 1, 3 inches high, 3 inches live stem, 6 years old; No. 2, 13 inches high, 15 inches live stem, 7 years old; No. 3, 8 inches high, 20 inches live stem, 7 years old; No. 4, 13 inches high, 22 inches live stem, 7 years old.



Since the general area in which the plot is located had been searched for ribes by eradication crews in 1935, an examination was made of all bushes pulled this year in order to determine the reason for so many ribes. As a result of this examination of 412 R. lacustre, 15 per cent were found to be regenerations from layered stems and 41 per cent from broken crowns. It is also worthy of note that not a single one of the regenerated bushes came from a broken root. In other words, 56 per cent of the ribes which were eradicated from the plot in 1941 were bushes which had been found but incompletely eradicated in 1935. Picture W 234 shows examples of typical poorly eradicated bushes. The remaining 44 per cent were bushes varying in age from 4 to 15 years. Twenty-six per cent of these were seven years old or younger, hence were from seed which had germinated since eradication in 1935. Thirty-six per cent of these were 7 to 8 years old and therefore probably were too small to be found readily in 1935. The remainder, or approximately 17 per cent of all bushes eradicated from the plot this year, were bushes missed in 1935.

#### SUMWARY

- 1. The 1941 season was more favorable for the intensification of the rust than the 1940 season since on the same plots more ribes bushes and leaves were infected and there was a greater amount of rust per infected leaf. Weather conditions were very favorable for pine infection, therefore a considerable increase in pine infection can be expected.
- 2. The inspection of the planted white pine on the plots on the Kaniksu operation revealed that a surprising amount of initial infection took place in 1937 from a relatively small amount of ribes, suggesting that very thorough eradication of ribes must be accomplished if protection is to be obtained.
- 3. The data for small bushes indicated that they are an important factor in the development of the rust on ribes. Consequently it may be necessary to remove them quite thoroughly in order to maintain protection of the white pine from blister rust.
- 4. The eradication of <u>R</u>. <u>lacustre</u> is a very difficult problem because of the ease with which the crown may be partly broken off and left to regenerate. No regeneration from roots was found, suggesting that if the crowns of <u>R</u>. <u>lacustre</u> are thoroughly removed the species will not regenerate from the roots.



# DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION AND PROGRESS OF RIBES ECOLOGY WORK IN THE NORTHWESTERN REGION FOR 1941

By

V. D. Moss, Assistant Forest Ecologist and H. R. Offord, Pathologist

### INTRODUCTION

The activities of the methods project in the Northwestern Region for 1941 included studies with hand methods of ribes eradication, checking of ribes ecology plots, the derivation and testing of a ribes regeneration key, and laboratory and greenhouse work at Berkeley.

The developmental work in hand methods of ribes eradication consisted in the preparation of a working plan, the selection and establishment of the experimental areas and the performance of field trials to determine the maximum production and efficiency for size of crews, width of crew strips, and methods of laying string lines. Two 160-acre experiments were conducted. One was located on the St. Joe operation in open reproduction and the other on the Clearwater Forest in cutover type. The one, two, and three-man crews were employed in the studies, working intervals of 6, 12, and 24 feet per man. Half the area was prestrung and on the remainder the crews laid their own string lines. Data obtained from these studies will be statistically examined and the results of the analysis will be presented as a special report. A preliminary report is given herein on the methods and procedures involved in the execution of the field studies.

The ecological work presented in this report deals with three grazing studies. These were inaugurated to determine the effects of sheep on the germination, growth, and development of ribes and western white pine in relation to ribes eradication work and the ultimate protection of white pine reproduction on cutover land. In addition, a report is given dealing with the germination and growth of the two major species of upland ribes, Ribes lacustre and R. viscosissimum, and western white pine on duff, mineral and burned-mineral soil surfaces, each under full sun, half shade and full shade conditions. A description of the ribes regeneration key is withheld from this report until further study can be made of the preliminary key developed during the latter part of the 1941 field season.

A list of the papers prepared in connection with laboratory and greenhouse work done at Berkeley during the winter of 1940-1941 is given in this report. A section has also been prepared on the status of recommendations on special methods of ribes eradication and new developments of 1941.

A Study to Determine the Relation Between Size of Crew, Width of Crew Strip and Method of Laying String Line to Obtain Maximum Production and Efficiency on Ribes Eradication

Size of crew, width of crew strip and method of laying string lines in advance or by the crews have been intricate problems since the inception of ribes eradication work in the Northwestern Region. Such factors as the change in status of control work, refinement of control standards, variation in methods,

labor and tools for ribes removal have materially influenced both the application of results from previous methods studies and the opinions formulated from practical field experiences. The present study was undertaken to help achieve the important objectives of maximum production and efficiency in ribes eradication under clearly defined field conditions.

Two 160-acre tracts were selected for the eradication studies. One was located on the Clearwater operation on cutover lands and the other on the St. Joe Forest in open reproduction. The general plan followed in the establishment of the working units was first to divide the 160-acre tracts into quarters and to select alternate quarters totaling 80 acres for each method of laying string line. Each quarter (40 acres) was then divided into nine blocks. The dimensions of each block were 144 feet by 1320 feet (20 chains). The first three blocks were assigned to the one, two and three-man crews working at an interval of six feet per man. The same crew formations, in the order above named, worked the next three blocks at an interval of 12 feet per man. The last three blocks in each quarter were worked at an interval of 24 feet per man. The nine blocks in each quarter thus represented the work of a one, two and three-man crew working a 6, 12 and 24-foot interval per man.

In order to facilitate the recording of data for each of the methods tested, each block was divided into eight plots. The plots comprised an area 144 feet by 165 feet (2½ chains). The 2½-chain boundaries were used as count lines to record the minutes of working time and the numbers of ribes pulled and missed by the eradication crews. Information was obtained for each crew tested on the basis of subplots, which differed from the plots only in regard to the widths. The subplots for each formation represented the maximum interval assigned to the crew. These were 24 feet wide for the one-man crew, 48 feet wide for the two-man crew and 72 feet wide for the three-man crew.

To mark the lateral count lines and all working divisions down to subplots, string lines were prelaid. The subplot string lines were used as guide lines for the start of a crew strip in each subplot. A regular crew formation was used for prestringing half of the 160-acre tract in advance.

Some exceptions to the general plan outlined for the establishment of the experimental areas were carried out for the study conducted on the St. Joe operation. It became necessary to select two comparable areas for the total required acreage in order to obtain conditions representative of typical open reproduction type. Working units for both were established in conformity with a plan of systematically distributing the crew formations over the area in such a manner as to secure a similarity of working conditions.

In the selection of crewmen for these studies, men of average caliber were obtained from adjacent blister rust camps. Twelve men were selected out of a cooperative camp for the Clearwater experiment. Six men were used on the St. Joe plots, three from a Forest Service regular and three from a cooperative camp. The same men were used throughout the study except for an occasional replacement necessitated by sickness or some other cause. When a man was excused from the job an alternate of equal caliber was used until the regular worker returned. Each man worked as a one-man crew and in the

two-man and the three-man formations for each method of laying string line.

The eradication tests were started by assigning six men to block 1, which contained six subplots each 24 feet wide. Each man worked four 6-foot strips which completed a subplot. As soon as block 1 was finished the six men were grouped into three two-man crews to work block 2. For block 3 the same six men were grouped into two 3-man crews. This procedure of changing crew sizes and crew widths continued until all nine blocks had been worked in the first quarter representing 40 acres.

Direct supervision was furnished to the crews by assigning an assistant camp boss or a man of equal ability to each six crewmen. In addition to the task of supervision, he recorded all data required. No missed ribes were pulled behind, as is the practice for the regular field operations. By this procedure it was possible to secure comparable data on the efficiency of crews.

No mop-up work in its true application was undertaken. Instead, a 50 per cent check was performed by a qualified checker. Successive strips, each 12 feet in width, were run through each subplot until half the subplot had been examined for missed ribes. The number of missed bushes was recorded by species and amount of live stem.

Because of the extensive work needed for adequate analysis of the raw field data, no conclusions in regard to the tests on size of crew, width of strip and method of laying string line are given in this report. Instead, data will be systematically grouped by ribes population classes and all relations expressed from regressions based on total ribes per acre. This will enable a comparison to be made for man-days of working time per acre and ribes per man-day between the various methods examined. The efficiencies of the various formations will be examined by the use of the analysis of variance and covariance. A special detailed report covering this work will be made upon completion of the statistical analysis.

## Status of Recommendations on Special Methods of Ribes Eradication and New Developments of 1941

Recommendations. Except as noted, reference should be made to the 1939 and 1940 annual reports for detailed recommendations on the following methods and equipment:

- 1. Light or medium weight claw mattock.
- 2. Use of dynamite for blasting troublesome ribes.
- 3. Broadcast spraying with Atlacide (R. petiolare) or Diesel oil (R. roezli seedlings).
- 4. Diesel oil for decapitated ribes in rocky locations.
- 5. Dry chemical for treatment of decapitated ribes. Use the new formula of one part by weight of dry, fine crystal common salt and one part by weight of dry powdered borax technical.
- 6. Bulldozer methods for brush removal in stream type.
- 7. D-2 Caterpillar tractor equipped with front end brush rake and rear end power hooks. Install steel rollers on rear end drum to guide and prevent undue wear of the cable.

Developments of 1941. An important new development of 1941 has been the testing of a ribes regeneration key in both the Northwestern and the Sugar Pine Regions. The purpose of this key is to facilitate the evaluation and interpretation of all ecologic data for any given area of ground to the end of predicting what the future regeneration of ribes on that area will be and at the same time to aid in establishing correct eradication plans for the immediate suppression of those ribes. Although the key is still in its developmental stage, preliminary tests were encouraging and further work should improve its usefulness and accuracy.

The operation of the hooks from the rear end of the D-2 tractor was improved by installing in a vertical position on the drum a pair of 12-inch steel rollers. This installation made it easier to roll out the cable by hand, and reduced friction and wear on it when the hooks were being pulled at an angle to the revolving cable drum.

An improved ribes peavy was designed and tested in the field with excellent results. A ribes tongs and hydraulically operated bar for lifting large deeply rooted ribes was designed by J. F. Breakey and tested under field conditions in Idaho and California. Special interest was attached to the design of the ribes tongs with the thought that they might be adapted to power equipment. It is unlikely that this type of apparatus will be useful to one or two-man crews, unless operated by power.

Repitition of cross and self-pollination tests on  $\underline{R}$ . roezli confirmed previous data showing that this species normally sets fruits in nature by cross-pollination.

Encouraging progress has been made in Idaho and California in ribes ecology work. The results of this work, as described by V. D. Moss (Northwestern Region) and C. R. Quick (Sugar Pine Region) relate to the germinative responses of white pine and ribes to the effects of grazing on ribes regeneration and to general relationships of ribes ecology and white pine and sugar pine silviculture.

## Laboratory and Greenhouse Work During 1941

At Berkeley, full use was made of laboratory and greenhouse facilities during the winter of 1940-1941 to carry on the following: (a) routine care of the Ribes Garden and greenhouse; (b) chemical and physical examination of many soil samples taken from field plots and study areas in California, Oregon and Idaho; (c) tests on the viability, longevity and general germinative response of ribes seeds. The following special reports were completed and distributed during 1941. The practical significance of the data in these is noted for each:

Serial No. 108. Methods Studies of the Tagging of Ribes Before Eradication, Virgil D. Moss.

In regard to rapidity of work by regular and prestringing methods slight but non-significant differences favored the regular method. Efficiency (i.e., number of plants remaining after the first working) was significantly better

for the regular method in areas of high ribes population and closely approached significance for low populations.

Serial No. 109. A Key to the Ribes of California, Clarence R. Quick.

Forty-three species and varieties of ribes are listed and described so as to facilitate their identification.

Serial No. 110. An Approximate Index of Habitat, Clarence R. Quick.

The proposed scheme and formula may be useful in correlating known sites of serious ribes regeneration, or insistent rust development with sites of similar potentialities.

Serial No. 111. Experimental Germination of Ribes Seed. Series of 1940. Clarence R. Quick.

These tests represent 1,548 separate cultures of ribes seeds totaling 99,670 seeds and cover 14 topics as related to germinative response of the seeds. Viability tests on old seeds collected from herbarium sheets show that several ribes species can retain viability under these conditions for 17 years.

Serial No. 112. Manual for Care of Ribes Ecology Plots, Sugar Pine Region, Clarence R. Quick.

Outlines schedules to be followed in care and in data taking for all field plots and includes location data and general objectives.

Serial No. 113. Self-Sterility in Several Ribes Species of Western United States, H. R. Offord, C. R. Quick and V. D. Moss.

Controlled cross and self-pollination of R. roezli, R. nevadense and R. viscosissimum showed that these ribes normally set seed-bearing fruits only after cross-pollination. Eradicative effort in connection with the blister rust control should be aided by this natural phenomena once the number of flowering ribes per acre has been substantially reduced. The small fruit crop of scattered ribes and rodent attacks on this diminishing supply will aid the natural suppression of ribes which normally takes place in ecologically maturing forest stands.

Field Study of the Relative Merits of Regular Stringing and Prestringing for Ribes Eradication Work in California, December 9, 1941, L. P. Winslow.

Analysis of field data for regular stringing and prestringing in California showed that there is no obvious advantage in saving of time or efficiency of work from either method for the field conditions under which the study was made. The choice between regular or prestringing should be left to the judgment of the responsible field supervisor.

## The Effects of Variable Light and Moisture Conditions on the Germination, Growth and Development of R. viscosissimum, R. lacustre and Pinus monticola

The purpose of this study is to secure information on the germination, survival and growth requirements of the two major species of ribes and of western white pine under full sun, half shade and full shade conditions. At each of these light stations ribes seed was sown at the rate of 800 per square foot and western white pine at the rate of 100 per square foot on undisturbed natural duff, on mineral, and on burned-mineral soil surfaces. The plot surfaces were prepared and rodent and bird proof fences constructed during the late summer and early fall of 1940. The seed was sown in late October of the same year. The initial phases of this project are described on pages 122 to 126 of the 1940 annual report.

Seedling counts were inaugurated May 6, 1941, and continued throughout the season at ten-day intervals. Each time the plots were examined all new seedlings which had become visible during the ten-day period were staked with colored toothpicks. Different colored toothpicks were used, each color representing the date of an examination. In the end this gave the number of seedlings appearing and surviving by ten-day intervals during the first season.

The mortality of seedlings was classified as having resulted from physical injury, insects, damping-off fungi, heat and drought. Physical injury is defined as failure of the seedling root or radicle to become firmly established in the soil. Much mortality resulted from this cause because all seed was sown directly on the soil surface. During each plot examination, all dead seedlings were removed, classified as to cause of death and recorded by the color of toothpick or date of appearance. By this procedure mortality can be correlated with the date of seedling emergence.

During the season, vertical root penetration and aerial development of seedlings were observed at monthly intervals. Root measurements were obtained by carefully removing the soil from around the roots of seedlings in the sown strips located at one end of the seedbeds. Within the seedbeds, morphological studies of aerial parts such as stem heights, number of leaves, etc., were made by selecting at random 10 seedlings in each subplot. At the end of the growing season and before defoliation had commenced, groups of seedlings were removed from the root-study strips and weights for their aerial and root portions were determined.

Surface soil temperatures were recorded daily during the period of optimum seed germination and heaviest seedling losses. The remainder of the time, these surface temperatures were recorded from three to five days while periodically examining the seedbeds. The 6-inch and 12-inch soil temperature readings were obtained at the time examinations were made for seedling germination and mortality. Soil samples, secured with the aid of a soil auger, were taken at 10-day intervals for moisture determinations of the surface, 6-inch and 12-inch zones. At the end of the season, soil samples from these three zones were sent to the Berkeley laboratory for hydrogen-ion determinations.

Some results of the first seasons study are shown in tables 1, 2 and 3. Table 1 gives the number of seedlings appearing between the dates of examinations. Table 2 shows the number of seedlings lost from the different causes (of mortality) for soil surfaces at the three light stations. Table 3 summarizes data which show the per cent (of total seed sown) germinating, the per cent (of total seedlings germinating) surviving, the per cent green weight of seedling tops over roots, and the actual gram green weight of seedling tops plus roots.

TABLE 1

OCCURRENCE OF RIBES AND WHITE PINE SEEDLINGS AT 10-DAY INTERVALS ON DUFF, MINERAL AND BURNED-MINERAL SOIL SURFACES AT THE FULL SUN, HALF SHADE AND FULL SHADE LIGHT STATIONS

				,			<del></del>		
							1	Burned	
		f Sur	-		ral Su			ral Su	
Date	R.	R.	P.	R.	R.	₽.	R.	R.	Р.
Checked	lac.	vis.	mont.	lac.	vis.	mont.	lac.	vis.	mont.
				Sun Li		in a company of the company of			
May 6	9	11	5	933	326	335	<del> </del>	114	56
May 16	1	2	2	638	260	267	261	81	67
May 26	2	3	4	634	460	155	507	265	86
June 5	1	0	2	392	172	71	364	177	83
June 15	2	0	7	406	68	44	297	69	15
June 25	0	0	0	83	27	6	67	16	7
July 5	0	0	0	93	9	3	62	18	0
7/15-9/13	0	0	0	5	0	2	0	0	0
Totals	15	16	20	3,184	1,322	883	1,966	740	314
		F	Half S	hade L	ight S	tation			
May 6	23	43	3	1,402	289	192	1,320	817	599
May 16	5	5	6	499	251	444	333	164	290
May 26	5	2	18	349	355	316	384	306	175
June 5	2	1	8	141	124	145	172	141	74
June 15	4	.1	11	117	61	61	192	101	54
June 25	0	1	2	60	11	8	62	16	5
July 5	3	1	0	97	0	3	140	7	3
7/15-9/13	0	0	1	60	1	1	47	4	0
Totals	42	54	49	2,725	1,092	1,170	2,650	1,556	1.200
			full S	hade Li	ight St				
May 6	149	168	51	812	268	221	1,304	424	384
May 16	228	50	137	687	335	424	403	495	344
May 26	219	36	258	260	325	367	284	413	281
June 5	98	11	211	79	78	226	96	105	231
June 15	69	16	163	55	53	171	69	88	119
June 25	5	7	15	15	16	16	19	21	13
July 5	3	0	6	20	6	9	14	8	7
7/15-9/13	0	0	0	9	2	0	44	0	2
Totals	771	288	841	1,937	1,083	1,434	2,233	1,554	1,379

Table 1 shows that on all soil surfaces and at all three light stations the majority of both the ribes and the white pine seed had germinated by June 15. The seed of R. lacustre was found to have germinated in greater abundance throughout the seedbeds at the three light stations than did seed of R. viscosissimum. In general, a larger amount of the total seed planted was found to have germinated for white pine than for either species of ribes. The duff surface was found to be the least favorable for the germination of all seed, and the mineral surface the most favorable. The germination of ribes and white pine seed was found to increase toward full shade conditions on the duff surface. On the mineral surface, the amount of seed germinating for R. lacustre and R. viscosissimum was found to decrease toward full shade conditions, whereas the amount of germination of white pine seed increased toward the same conditions. On the burned-mineral soil surface, the numbers of seed germinating for both ribes and white pine was the least at the full sun station and of about equal numbers at the half shade and full shade stations.

TABLE 2

OCCURRENCE AND CAUSE OF RIBES AND WHITE PINE SEEDLING MORTALITY THE FIRST SEASON FOLLOWING GERMINATION ON DUFF, MINERAL AND BURNED-MINERAL SOIL SURFACES AT THE FULL SUN, HALF SHADE AND FULL SHADE LIGHT STATIONS

						-							
			Ribes	s lacusti	re	Ril	oes v	iscosiss	Lmum		Pinus	montico.	La
t ee		Ту	pe of	Surface		Ту	oe or	Surface		Ту	pe of	Surface	
egre ight	Cause of	ıff	Min-	Burned ·		1ff	Min-	Burned	To-	ıff	Min-	Burned	To-
A	Mortality	Du	eral	Mineral	Total	Da	eral	Mineral	tal	Da	eral	Mineral	tal
	Physical		79	121	200	3	77	24	104	2	254	86	342
Sun	Insect		4	2	6		1		1		53	13	6 <b>6</b>
	Damping-off						17		17				
Ful1	Heat	6	623	680	1,309		139	75	214	4	13	8	25
E	Drought												
	Physical	4	51	26	81	7	41	35	83	7	51	140	198
9	Insect						1		1	2	12	17	31
Half Shad	Damping-off						30	57	87		1	2	3
Ha	Heat	6	24	89	119	3	11	31	45	3	7	21	31
	Drought			17	17			1	1				
	Physical	25	167	78	270	11	133	54	198	59	84	107	250
o o	Insect					1			1	4	14	6	24
Full Shad	Damping-off	7	36	15	58	1	29	126	156	75	157	1.92	424
Ful	Heat												
	Drought	52	1		53	28	1		29	<b>37</b>			37

Commencing with the first examination, seed germination was considered complete upon the appearance of the radicle. The radicle or root of a large number failed to become oriented and established in the soil, which resulted in their early death. Mortality resulting from this cause was classified as physical and was especially heavy on soil surfaces which tended to dry early in the season. The remaining four types of mortality were used to designate loss of seedlings after they had become established and when the cotyledons became visible.

Insects were found to inflict a greater loss to white pine than to ribes seedlings. Damage resulting from this cause was due chiefly to cutworms and adult beetles. Loss from damping-off organisms increased as the canopy closed and tended toward full shade. The organisms attacking both pine and ribes seedlings have not all been identified, although preliminary work has shown that Cylindrosporium ribis Davis probably was the fungus causing a heavy loss of ribes. There still remains some question in regard to the conspecificity of this species with Septoria sibirica Thuemen. The identification of the various organisms collected from the seedbeds is being made by Dr. John Ehrlich, Associate Professor of Pathology at the University of Idaho.

Loss from heat was found to be most severe at the full sun station. Mortality from this cause was identified by conspicuous heat lesions on the stems of both ribes and white pine seedlings. On the other hand, loss from drought occurred almost entirely at the full shade station. Drought kill was identified by the shrinkage and drying of seedlings without the presence of lesions or damping-off organisms. In general, it was found that the mortality of seedlings from physical causes occurred early in the season; that losses from insects continued throughout the season; that losses from damping-off organisms occurred in late spring and early summer, and that losses from heat and drought occurred during the latter part of July and throughout August.

SUMMARY OF SOME FIRST SEASONS COMPARISONS SHOWING PER CENT OF SEED GERMINATING, PER CENT OF SEEDLINGS SURVIVING

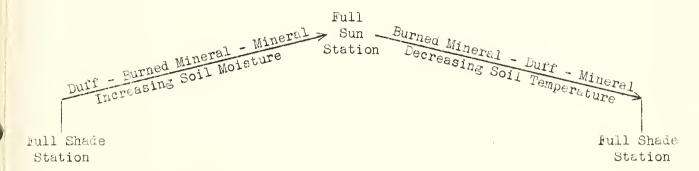
TABLE 3

AND SEEDLING WEIGHTS AS A MEASURE OF GROWTH

	Ril	nes lacus	stre	Ribe	s viscos:	issimum	Fi	nus mont:	icola
			Surface,		of Soil S			of Soil S	
		ch Sown i			ch Sown I			ch Sown V	
Degree		16,000 S			16,000 S			2,000 See	the same of the sa
of			Burned		į ·	Burned			Burned
Light	Duff	Mineral	Mineral	Duff	Mineral	Mineral	Duff	Mineral	Mineral
		Per Cer	nt of Tot	tal So	wn Seed (	Jerminati	ing		
Full Sun	.1	19.9	12.3	.1	8.3	4.6	1.0	44.2	15.7
Half Shade	.3	17.0	16.6	.3	6.8	9.7	2.5	58.5	60.0
Full Shade	4.8	12.1	14.0	1.8	6.8	9.7	42.1	71.7	69.0
		Per Ce	ent of To	otal Se	eedlings	Survivi	1g		
Full Sun	60.0	77.8	59.2	81.3	32.3	86.6	70.0	63.8	65.9
		97.2	95.0	81.5	92.4	92.0	75.5	93.9	85.0
Full Shade	89.1	89.5	95.8	85.8	84.9	88.4	79.2	82.2	77.9
Rati	lo of i	er Cent			at in Top O Plants		r Cent	in Root	Ś
Full Sun		<u>67</u> 33	71 89		7 <u>4</u> 26	77 23		<u>40</u> 60	<u>41</u> 59
Half Shade		7 <u>4</u> 26	79 21		<u>78</u> සව	<u>31</u> 19		<u>49</u> 51	<u>47</u> 53
Full Shade	77 23	81 19	85 15	79 21	<u>83</u> 17	89 11	<u>55</u> 45	<u>57</u> 43	<u>58</u> 42
		Total (		-	er Seedl: Dirlants	-	rams		
Full Sun		.29	2.84		1.28	5.29		.67	.79
Half Shade		.18	1.70		.57	4.68		.39	.43
Full Shade	.13	.05	.10	.33	.10	.21	.11	.09	.07

A brief digest of the more important results obtained from the first years study of the plots is presented in table 3. All information has been included except soil moisture and soil temperature readings. These are withheld because complete seasonal readings cannot be obtained until the plot values are correlated with climatological data taken at the Bismark Ranger Station and at the Priest River Experiment Station. A diagrammatic chart follows which gives the general seasonal trends for soil moisture and soil temperature. This chart represents the conditions found existing at each of the light stations for moisture and temperature at the soil surface. References to soil moisture and soil temperature in relation to seed germination and survival will be based on the chart showing general seasonal trends and not upon daily readings.

# DIAGRAMMATIC CHART SHOWING GENERAL SEASONAL TRENDS FOR SOIL MOISTURE AND SOIL TEMPERATURE AT THE THREE LIGHT STATIONS



The percentage of ribes and white pine seed germinating is shown in table 3. These values represent the per cent of total sown seed that germinated on each plot. It is interesting to note from these general trends that the percentage of ribes seed germinating on mineral soil increased toward full sun conditions, and conversely, the percentage of white pine seed germinating increased toward full shade conditions. The percentage of white pine seed germinating is also observed to increase toward full shade conditions on the duff and burned-mineral soils. These trends reveal that the germination of white pine seed increases toward a condition of heavier soil moisture and a lowering of soil temperature. On the other hand, it is observed that the percentage of ribes seed germinating increased toward a condition of decreasing soil moisture and a rising soil temperature. This fact is always true unless there exists an inadequate amount of soil moisture to promote germination. In such a case, the number of seed germinating will increase toward a condition of suitable soil moisture and a lowering of soil temperature. This trend is shown in table 3 for the germination of ribes and pine seed on the duff surface. It is also brought out by the diagrammatic soil moisture and soil temperature chart. The per cent of seed germinating is observed to increase from full sun to full shade conditions on this surface. The mineral surface in this study was found to have the nearest to optimum conditions for seed germination of the three soil surfaces represented.

The per cent of total seedlings surviving at the close of the first growing season was quite comparable for all species tested. Many seedlings of all species died from physical injury and from severe heat at the full sun station. In fact, mortality was found to be greatest at this station and least at the half shade station. At the latter, damping-off, physical injury and drought were the major causes of mortality. Loss from drought at this station occurred almost solely from shallow-rooted seedlings on the natural duff surface.

By weighing separately the tops and roots of 50 ribes seedlings it was found that under all conditions the tops are heaviest. Going from full sun to full shade conditions the volume in tops increased while that in roots decreased. This also holds true in all cases for the transition from duff, to mineral, to burned-mineral soil. Similar data for white pine seedlings show that tops

are lightest and roots heaviest for plants grown in full sun, while the opposite is true for those grown in full shade.

Comparing the total weights of seedlings it is evident that the greater the shade the lighter the plant. This holds true for ribes and pines alike. An outstanding characteristic of the ribes, however, is that a radical weight differential results from soil differences, the burned-mineral type producing by far the heaviest plants. This was partly due to the immediate increase in the available mineral nutrients caused by the burning of all organic material, and partly to change in crumb structure of the soil which gave better aeration and provided a more favorable medium for root development.

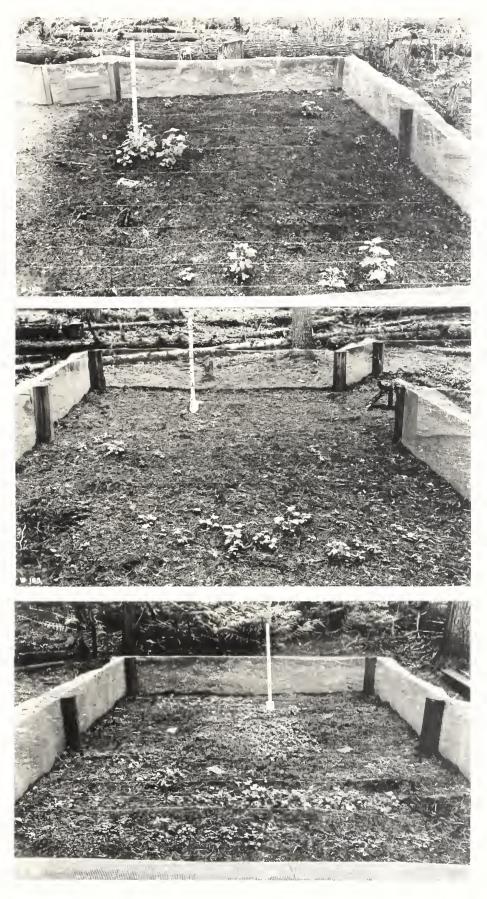
Several of the outstanding plant development differences revealed in this study are shown pictorially in the accompanying plates. Forest conditions surrounding the light stations and general seedbed construction are shown in Plate I. Germination and seasonal growth differences of seedlings on the various soils at each of the light stations are brought out in Plates II to IV. In photos W 180 and W 185, R. viscosissimum is the most noticeable species whereas in photo W 190 seedlings of all species can be observed in the separate subplot divisions. Plate III shows the extent of germination and the seasonal growth of all seedlings on the mineral soil surface at each of the three light stations. Plate IV shows the extent of germination and the seasonal growth of all seedlings on the burned-mineral soil surface at each of the three light stations. Of particular interest in the latter is the sturdy development of ribes shown in photo W 178, the tall and luxuriant growth shown in photo W 183 and the lack of good development in photo W 188. An interesting comparison can also be obtained by examining the different plates which represent germination and subsequent growth and development of seedlings during the first season on the three soil surfaces.

In Plate V, picture W 168 shows the seasonal development of seedling roots and aerial parts for the three species grown on a mineral soil medium. The lower picture, W 174, shows the development of the two species of ribes and western white pine grown on a burned-mineral surface. Seedlings shown in section A were obtained from the full sun station, seedlings of section B from a half shade station and seedlings of section C from full shade conditions. Seedling mounts with a numeral to the right of the specimen are identified as follows: (1) western white pine; (2) R. viscosissimum; (3) R. lacustre. The differences in the lengths of roots are particularly striking for seedlings from full sun toward full shade conditions. A noticeable difference can also be seen between height growth of seedlings grown on the burned-mineral medium and those grown under the same intensities of light but on a mineral stratum.



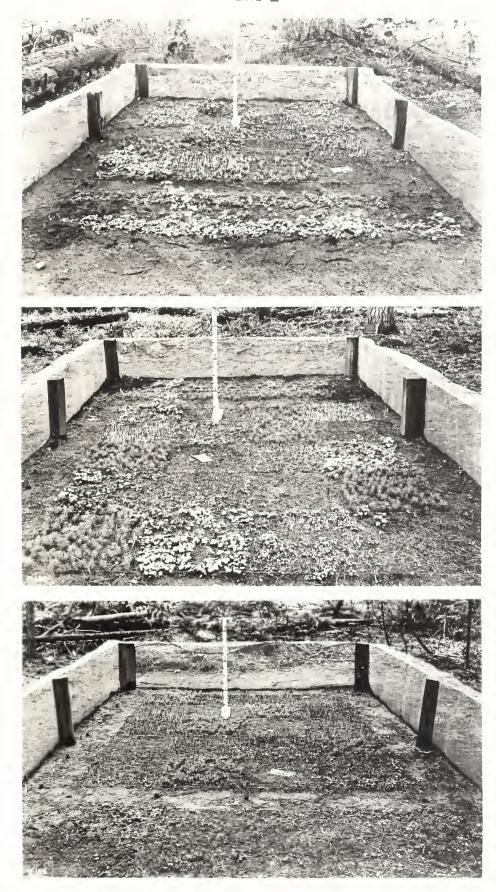
Forest conditions surrounding the rodent and birdproof seedbeds at the full sun (W 157), half shade (W 159) and full shade (W 163) stations.



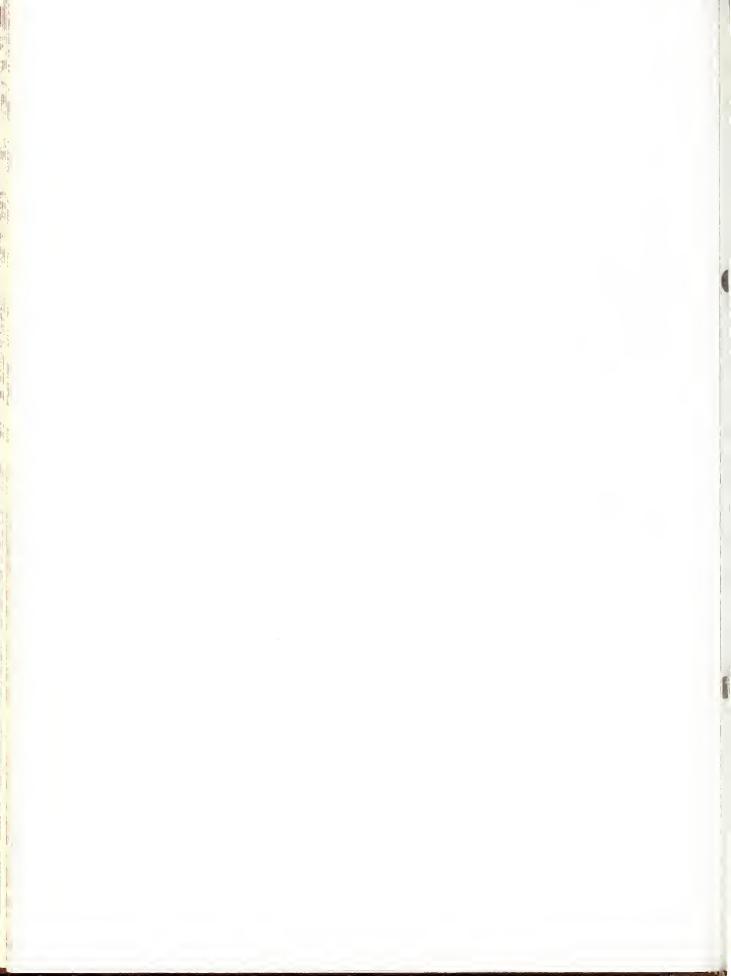


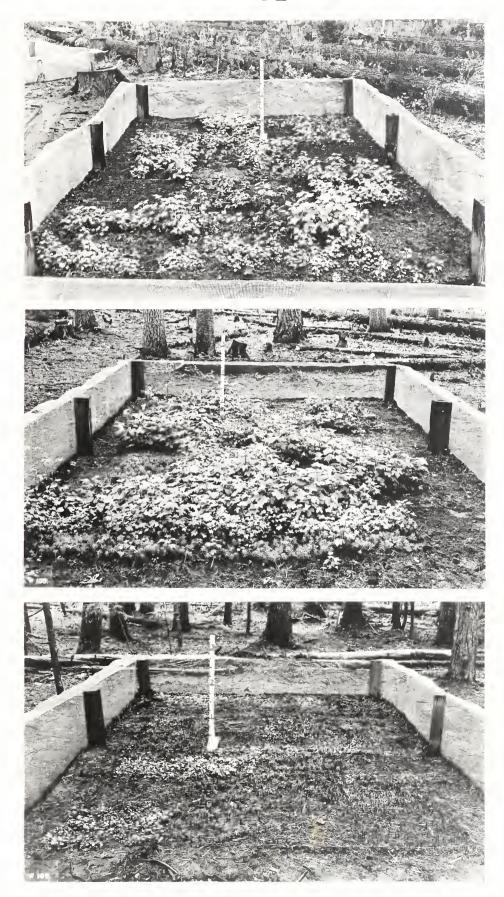
Abundance and first seasons development of ribes and white pine seedlings germinating on natural duff surface. Full sun (W 180), half shade (W 185), full shade (W 190).



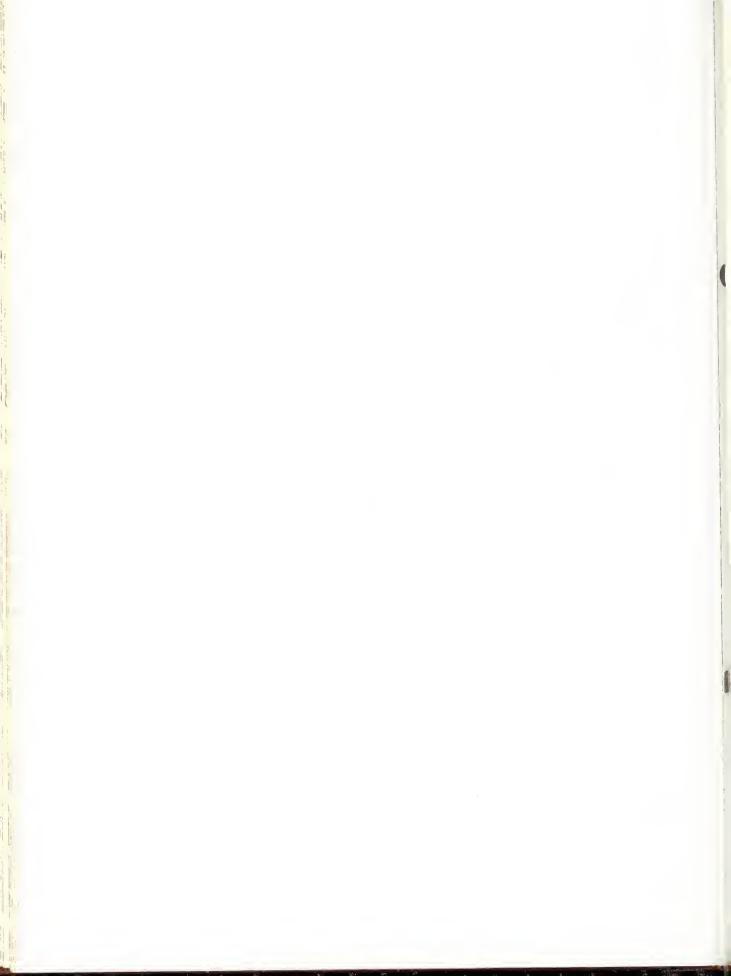


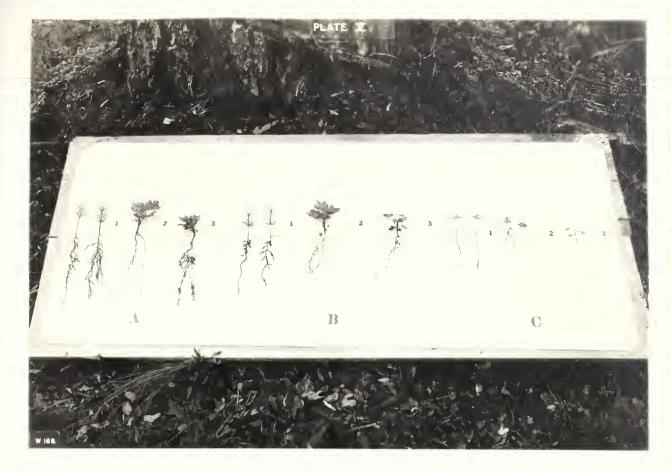
Abundance and first seasons development of ribes and white pine seedlings germinating on mineral soil surface. Full sun (W 181), half shade (W 186), full shade (W 189).

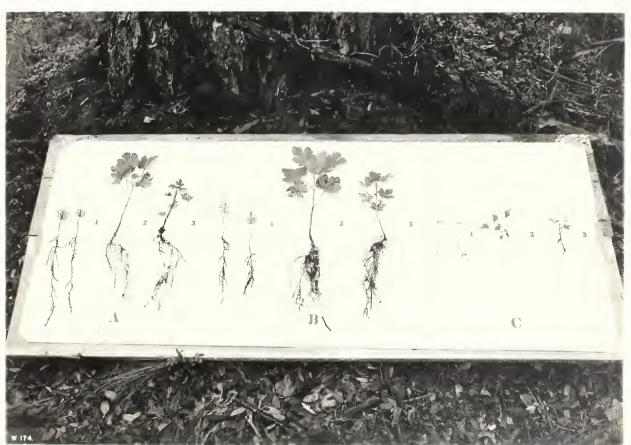




Abundance and first seasons development of ribes and white sine seedlings germinating on burned-mineral soil surface. Full sun (W 178), half shade (W 183), full shade (W 188).







Fisects of seedling development at the end of the first growing season from mineral (W 168) and burned-mineral (W 174) soils. (A) Full sun, (B) Half shade, (C) Full shade. (1) Western white pine, (1) Ribes viscosissimum, (3) F. lacustre.

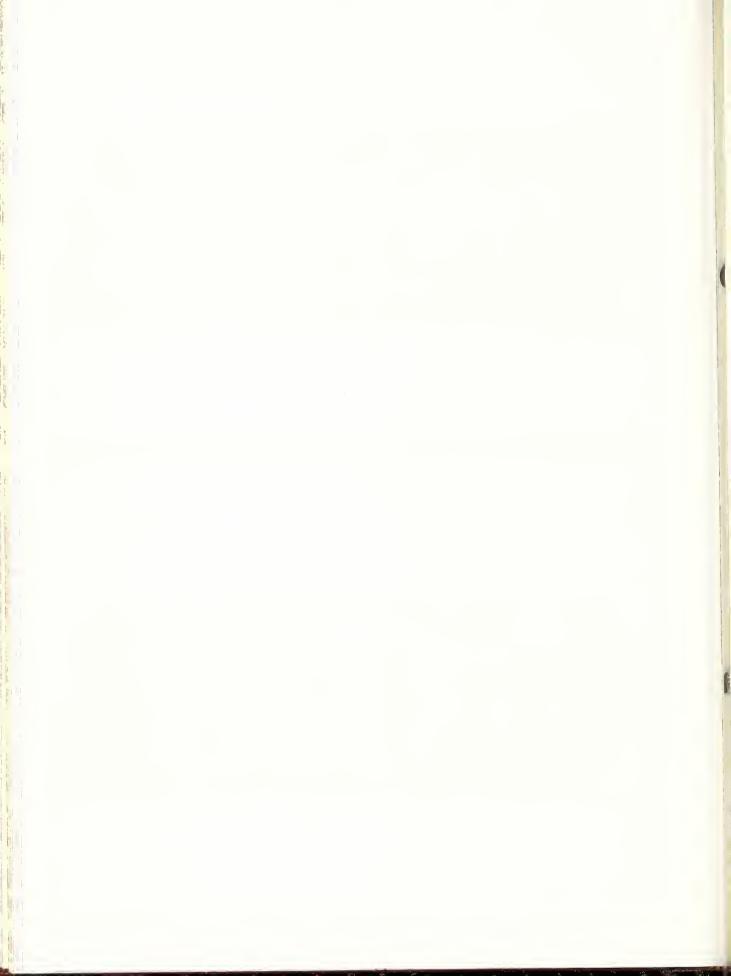


TABLE 4

# PH MEASUREMENTS OF SOIL SAMPLES TAKEN FROM LIGHT-MOISTURE PLOTS, LIGHT CONDITIONS AND SOIL SURFACES AS SHOWN

			of So	oil Samp	le	
					Burned-N	Mineral
Soil	Duff S	urface	Mineral	Surface	Sur:	face
Zone	1940	1941	1940	1941	1940	1941
		Fu	ll Sun St	tation		
Surface	5.04	5.33	5.99	6.18	7.49	7.16
6 inch	5.57	5.84	5.67	6.01	5.59	6.26
12 inch	5.79	5.75	5.92	5.92	5.62	6.18
		Hal	f Shade S	Station		
Surface	5.29	5.27	5.79	5.84	7.22	6.95
6 inch	6.01	6.35	5.97	6.26	6.05	6.24
12 inch	5.90	6.01	5.72	5.93	5.92	5.96
		Ful	l Shade S	Station		
Surface	5.36	5.17	6.01	6.01	7.20	7.20
6 inch	5.92	5.90	5.88	6.01	5.58	5.82
12 inch	5.90	5.67	5.63	5.67	5.92	5.84

Hydrogen-ion determinations are shown for the three light stations by type and depth of soil surface in table 4. The three soil zones for the duff plots have exhibited little or no change from the original pH determinations. Exposing of mineral soil has reduced the acidity of nearly all soil zones at the three light stations. The strong alkalinity of the surface burned-mineral soil samples in 1940 has been greatly reduced at the full sun and half shade light stations. The acidity of the 6 and 12-inch zones has been reduced by the leaching of the alkaline deposits on the soil surface. Leaching of the alkaline deposit into the lower soil zones has been greatest at the full sun station with a decrease toward the full shade station. The latter has shown no appreciable change from the initial pH determinations. This is probably due to the insulation through shade against excessive temperature and moisture variation.

## The Effect of Grazing by Sheep on the Germination, Growth and Development of Ribes and Western White Pine on Recently Cutover Areas

This study is represented by five grazing exclosures, each one-tenth acre or more in size. Three of these are located on the Clearwater and two on the St. Joe forests. Two of the Clearwater exclosures were established in 1939, while the third on this forest and those on the St. Joe forest were started in 1940. Areas identified as exclosures are barricaded from sheep by the construction of a five to six strand barbed-wire fence.

Associated with each exclosure is a control plot of equal size which is grazed. Each control has been divided into halves with a half located on either side of the exclosure. This permits a wider distribution of sampling

for the intensity of grazing and approaches uniformity of conditions surrounding the exclosure.

Two major examinations are made of these plots with one check conducted prior to and the other following grazing. In addition, plots which are to be grazed during the fall months are checked in the spring of the same year, and plots grazed during the spring and early summer season are checked a third time during the early part of September. This is done in order to obtain an accurate history of seedling development.

Descriptions of plots and the results from 1939 and 1940 observations are to be found in annual reports for those years as follows: 1939, page 138; and 1940, pages 126 to 128.

The results of the 1941 field examinations showing white pine and ribes seedling occurrence and mortality are presented herein in tabular form. Morphological comparisons for ribes are given in the discussions accompanying each table.

TABLE 5

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER THREE YEARS FALL GRAZING (PLOT 1, EAST EXPOSURE, CLEARWATER FOREST)

Type	Status		1	Jumber	r Pine	es			ľ	Numbe:	r Ribe	es	
of	of		by 3	lear d	of Or:	igin			ру 1	lear o	of Ori	lgin	
Plot	Plant	1937	1938	1939	1940	1941	Total	1937	1938	1939	1940	1941	Total
Exclosure	Alive	4	136	101	12	1	254	0	34	32	8	2	76
(Ungrazed)	Dead	0	8	6	0	0	14	0	1	6	1	0	8
Control	Alive	6	123	92	11	1	233	1	53	30	4	0	88
(Grazed)	Dead	0	5	1	0	1	7	1	4-	1	0	0	6

The area represented by plot 1 was partially logged during 1937 and complete slash disposal measures were employed that fall by the piling and burning method. An examination of table 5 shows a large influx of both pine and ribes seedlings occurred the following spring, 1938, resulting from the initial disburbance of a 100 to 120-year-old virgin forest stand. The greater number of seedlings germinated by 1939, although a few continued to appear through 1941.

The area around plot 1 has been grazed about the 25th of September for the past three seasons. The degree of grazing has been measured as less than medium in intensity with practically all damage restricted to loss of terminal buds and leaves of the ribes. Fall sheeping of less than medium intensity has caused neither a noticeable increase nor decrease of the ribes and pine seedling population during the three year cropping of plot 1.

A somewhat different morphologic picture is presented for ribes on this area. For the 76 ribes bushes alive within the exclosure average measurements per bush are as follows: height, .74 feet; feet of live stem, 1.12; number of main stems, 1.13; number of laterals, 1.37; and number of leaves per bush,

15.11. For the 88 ribes alive on the control, average measurements per bush are as follows: height, 1.03; feet of live stem, 2.05; number of main stems, 1.17; number of laterals, 4.47; and number of leaves per bush, 25.16. The most striking difference between bushes browsed and not browsed is in the numbers of laterals and leaves per bush. This has resulted from the browsing in which continual cropping of terminal buds causes many new laterals to be born each spring on stems deprived of their terminal buds which in turn increases the numbers of leaves. No serious physical damage has resulted to the 233 live pine seedlings on the control, except slight main stem base scarring of a few.

The results of three seasons grazing on ground around plot 2 (a westerly exposed plot in the vicinity of plot 1) are shown in table 6. This western site has only about half the palatable plant population of the easterly exposure around plot 1. It is an area which sheep normally traverse quite rapidly, picking at a plant here and there but never stopping for any intensive degree of browsing.

TABLE 6

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER THREE YEARS FALL GRAZING (PLOT 2, WEST EXPOSURE, CLEARWATER FOREST)

Туре	Status		1	Jumber	rine	3			1	lumbei	r Ribe	es	
of	of		ру 🦠	lear o	of Ori	gin			by 3	Zear d	of Or:	igin	
Plot	Plant	1937	1938	1939	1940	1941	Total	1937	1938	1939	1940	1941	Total
Exclosure	Alive	1	34	33	2	2	72	3	23	7	1	0	34
(Ungrazed)	Dead	0	0	1	0	0	1	0	4	2	0	0	6
Control	Alive	2	29	32	10	5	78	3	12	0	0	0	15
(Grazed)	Dead	O	2	1	0	0	3	1	1	0	0	0	2

Logging and slash disposal measures in the vicinity of plot 2 were similar to those employed in the area around plot 1. A larger proportion of mixed tree species was present and logged from this western exposure than on the eastern site. White pine seed trees are uniformly distributed throughout the entire area surrounding both plots, so that there is an adequate seed supply during a good cone year.

Table 6 shows that the germination of pine seed continued to establish about equal numbers of seedlings within the exclosure and on the control over a period of two years following the logging disturbance. Following this period, the decrease in numbers of new seedlings was more noticeable within the exclosure than on the control. If this difference can ultimately be proved significant, it is reasonable to suppose that the trampling by sheep has created more favorable seedbed conditions for the germination of pine seed by continual loosening of the forest floor mantle.

In regard to the germination of ribes, there was found to be one favorable year following logging with some continuation through 1940 within the exclosure. The results shown in table 6 might indicate that the continual loosening of the surface soil does not favor the establishment of new ribes seedlings

but other factors may enter here. Ribes vertical root development has been found to be much slower than that for white pine seedlings. On sites subjected to early summer drought, the loosening of the surface soil by trampling may be responsible for heavy loss by drought and furthermore may create unfavorable conditions for the germination of ribes seed. Such a conclusion cannot of course be considered valid until further studies have been made probably for a period of at least five years.

For the 34 ribes bushes alive within the exclosure average measurements per bush were found to be as follows: height, .77 feet; live stem, 1.32 feet; number of main stems, 1.28; number of laterals, 7.17; number of leaves per bush, 15.86. For the 15 bushes alive on the control average measurements are as follows: height, .84 feet; live stem, 1.56 feet; number of main stems, 1.00; number of laterals, 6.06; and 24.24 leaves per bush. Here again as observed for morphological comparisons of ribes on plot 1, a larger number of laterals and leaves per bush was recorded for ribes on the control than for bushes within the exclosure. Examinations revealed cropping of terminal buds by sheep was responsible for the greater number of laterals and leaves per bush.

The stand of timber partially removed in the vicinity of plot 3 is approximately the age of that surrounding the two former plots, but differs in that a few dominant trees, 160 years old or more, were present. The type of cutting and slash disposal methods employed around plot 3 was similar except for a few slash rires which were allowed to run broadcast. Practically all exposures are present, the larger portion of the area having northern and southern aspects. This area is grazed around the 15th of September or about 10 days earlier than plots 1 and 2. It receives about the same intensity of browsing, having been measured the last two years as receiving slightly less than a medium degree of trimming. The results of two seasons study are shown in table 7.

TABLE 7

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER TWO YEARS FALL GRAZING (PLOT 3, GENERAL ASPECT, CLEARWATER FOREST)

Туре	Status		1	Numbe:	r Pin	3			1	Jumber	r Ribe	es	
of	of'		ру 🦠	Year o	of Or	igin			by :	lear o	of Or:	igin	
Plot	Plant	1937	1938	1939	1940	1941	Total	1937	1938	1939	1940	1941	Total
Exclosure	Alive	16	434	406	39	4	899	3	36	45	2	3	89
(Ungrazed)	Dead	0	4	12	0	1	17	O	1	3	1	0	5
Control	Alive	23	329	87	14	5	458	4	146	35	4	4	193
(Grazed)	Dead	0	1	0	0	0	1	0	8	1	0	0	9

Of particular interest on plot 3 is the striking contrast between the numbers of pine and ribes seedlings within the exclosure and on the control. A few slash fires were allowed to run beyond the perimeter of the piles on the control with the result that limited portions of the forest floor mantle were consumed. This was responsible on a small part of a northern aspect for releasing a larger quantity of ribes seedlings as well as creating a more favorable condition for the germination of ribes seed. It is believed that

the intensity of this burn on the northern aspect of the control destroyed practically all the stored white pine seed, whereas the similar aspect within the exclosure was not subjected to the burn. Approximately 90 per cent of the seedlings of both pine and ribes were becoming established on the better and more favorable exposures. The extent to which trampling by sheep has affected further germination on the controls can not be determined from the results of study to date.

For the 89 ribes bushes alive within the exclosure average measurements per bush were found to be as follows: height, 1.04 feet; live stem, 2.19; number of main stems, 1.38; number of laterals, 3.91; and 23.39 leaves per bush. For the 193 alive bushes on the control average measurements per bush are as follows: height, 1.00 feet; live stem, 2.11; number of main stems, 1.33; number of laterals, 4.75; and 26.15 leaves per bush. With only two years grazing of approximately medium intensity, no significant morphological differences have occurred between ribes within the exclosure and those on the control.

Plots 4 and 5 on the St. Joe operation are located in a forest stand approximately 180 to 200 years old. This heavy mature to overmature white pine stand was intermixed with western hemlock, white fir, western red cedar and a small amount of western larch. All pine had been forced into the dominant and codominant classes, consequently when logged no seed trees were left on the area. The stand was removed during 1937, and the slash disposal measures applied the same fall were considered to be inadequate. Slash was loosely piled and many of the piles were not ignited.

White pine seedlings for restocking of this area must come largely from viable seed produced before the stand was logged, since no adjacent seed trees are present. Ribes seedlings will come from seed stored in the forest floor mantle during the early years in the development of the stand. The results of two years study on a north and south aspect are shown in tables 8 and 9.

#### TABLE 8

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER TWO YEARS EARLY SUMMER GRAZING (PLOT 4, NORTH EXPOSURE, ST. JOE FOREST)

Type	Status		N	umber	Ribes	3	
of	of		by ?	Year o	of Or	igin	
Plot	Bush	1937	1938	1939	1940	1941	Total
Exclosure	Alive	4	185	98	22	8	317
(Ungrazed)	Dead	0	3	1	0	0	4
Control	Alive	7	139	72	13	5_	236
(Grazed)	Dead	9	46	28	5	8	96

The number of ribes removed outright by trampling and through pulling by sheep while browsing has been extremely heavy on this plot. Responsible for this have been at least four major factors: steepness of slope, looseness of soil in the early summer season, abundance of ribes intermixed with many

species of less palatable brush, and better than a medium degree of grazing. It was observed that the roots of many ribes had been partially removed or loosened the first year during grazing. Practically all these ribes were found to have been eliminated during the second season. Many still recorded as alive have little likelihood of surviving one or more years of the heavier type of early summer cropping.

Located on the slope opposite plot 4 is plot 5. This area has a southern aspect and contains only about 70 per cent of the forage population found on plot 4. The area receives approximately the same intensity of grazing as the opposite exposure of the drainage, except that less time is actually involved for the sheeping. The ribes population runs heavier to R. viscosissimum on this slope while R. lacustre predominates on the northern face of the drainage. Data to indicate the results of two seasons grazing are shown in table 9.

TABLE 9

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER TWO YEARS EARLY SUMMER GRAZING (PLOT 5, SOUTH EXPOSURE, ST. JOE FOREST)

Туре	Status		N	umber	Ribe	ŝ	
of	of		by T	Year (	of Or	igin	
Plot	Bush	L957	1958	1939	1940	1941	Total
Exclosure	Alive	4	35	12	1	0	52
(Ungrazed)	Dead	0	1	0	0	0	J
Control	Alive	0	85	16	1	0	100
(Grazed)	Dead	1	17	8	1	0	27

About 21 per cent of the ribes has been removed from the control of this plot by the action of sheep as compared to 39 per cent for plot 4. Nearly all germination of ribes seed was complete by the second season following logging. On this area there is no evidence that the action of sheep will cause continued germination of ribes seed beyond the period normally associated with the logging disturbance. The results of two seasons study of plots 4 and 5 clearly indicate that this intensity of grazing carried on during the early summer season has been responsible for a large mortality of ribes seedlings. Of the small number of pine seedlings germinating, caused directly by the action of sheep, no loss has been observed.

# The Effect of Controlled Grazing on the Germination, Growth and Development of Ribes and Western White Pine on Cutover Areas

To determine the influence of controlled intensities of grazing upon the plants occurring on cutover white pine lands, a  $2\frac{1}{k}$ -acre fenced area was established. This fenced area was divided into two l-acre enclosures and one  $\frac{1}{k}$ -acre exclosure. The two enclosures were grazed for the first time under controlled conditions in 1939. Both were cropped by 50 head of sheep composed of 22 ewes and 28 lambs. The enclosure designated section A was grazed for a period of three days and section C for a period of two days. This was at a utilization

rate of 14 acres per animal unit for section A and 21 acres per animal unit for section C. Section B remained ungrazed. Using about the same number of sheep divided between lambs and ewes, the two enclosures will be grazed annually under similar restrictions until sufficient information has been obtained to serve the purpose of the study.

The task of securing information on the regeneration and development of ribes as affected by known intensities of grazing was assigned to the Methods Project in 1940. Information relative to the proper utilization of range lands and the effects of sheeping on coniferous reproduction is being obtained by one or more men assigned by the School of Forestry at the University of Idaho. The first report given on the status of ribes is presented on pages 129 to 131 of the 1940 annual report. The results of the 1941 check are shown in table 10 of this report.

### TABLE 10

STATUS OF RIBES SEEDLINGS IN 1941 AFTER THREE YEARS OF CONTROLLED GRAZING (PLOT 8, NORTH AND SOUTH EXPOSURES, CLEARWATER FOREST)

Type of	Status of	by		er Ril	bes Origin	n ·
Plot	Bush	1935-38	1939	1940	1941	Total
Section A	Alive	9	2	0	0	11
Grazed 3 days	Dead	5	1	0	0	6
Section B	Alive	26	0	0	0	26
Ungrazed	Dead	0	0	0	0	0
Section C	Alive	14	0	0	0	14
Grazed 2 days	Dead	0	0	0	0	0

Ribes that were present on the area prior to the establishment of the plots are shown under the dates 1935 to 1938. A total of six ribes has been destroyed by sheep on section A, while no loss of ribes has occurred either naturally within section B, the ungrazed control, or by the action of sheeping for two days on section C. Except for two ribes that became established in 1939 in stream type of section A, no additional seedlings have appeared.

For the 11 ribes alive on section A, average measurements per bush are as follows: height, 1.18 feet; live stem, 3.40; number of main stems, 2.00; number of laterals, 6.09; and number of leaves per bush, 31.73. For the 14 ribes alive on section C, which was grazed for a period of two days, average measurements per bush were found to be: height, 1.11 feet; live stem, 3.84 feet; number of main stems, 2.43; number of laterals, 7.71; and 32.57 leaves per bush. For the 13 ribes alive on section B, the ungrazed control, average measurements per bush were found to be: height, 1.22 feet; live stem, 4.43 feet; number of main stems, 2.00; number of laterals, 10.69; and 49.85 leaves per bush. These comparisons show that ribes within the ungrazed control had structural developments in excess of those on the enclosures for all morphological parts except number of main stems. This might be accounted for by the fact that the area was grazed for two or three years before the

establishment of the plots, and that the ribes within the exclosure have since had an opportunity to attain normal development. This also appears to be the explanation for the greater number of laterals and leaves which always follow the light cropping of terminal buds. In contrast is the severe type of grazing found in the enclosures wherein the structural development of nearly all bushes is materially obstructed.

## The Effects of Deferred Grazing on the Germination, Growth and Development of Ribes and Western White Pine

Investigations were started in 1940 on cutover land in the Clearwater Forest to determine whether the conditions for ribes eradication could be materially improved by the deferment of grazing until adequate control measures could be established. On many areas of this type in the southern part of this forest it has been found difficult to eradicate sufficient ribes to meet exacting control standards due to the small size of large numbers of grazed bushes. It has been the general opinion that grazing is responsible for the establishment of many new ribes and they are held in a dwarfed condition by the moderate to severe annual grazing of sheep on these areas. The present study will serve to answer these questions by comparing the morphologic development of ribes exposed to grazing with those deferred from grazing, and by showing the status of new ribes seedlings under both conditions. The first report on these studies is presented on pages 128 and 129 of the 1940 annual report.

The results of two seasons study are shown in table 11 for a north exposure and in table 12 for a south exposure. Seedlings that became established succeeding logging and until the time protection was given by construction of an exclosure, have been grouped under the years 1935 to 1938. Although the exclosure was not established until 1940, the 1939 seedlings and those germinating through 1941 are shown under separate columns in the table. An examination of the data shown in table 11 presents a striking comparison between the number of ribes seedlings becoming established within the exclosure as against the number appearing on the area grazed annually.

TABLE 11

STATUS OF RIBES AND WHITE PINE SEEDLINGS AFTER TWO YEARS MIDSUMMER GRAZING (PLOT 6, NORTH EXPOSURE, CLEARWATER FOREST)

		Number Pine					Number Ribes				
	Status	by Year of Origin					by Year of Origin				
Type	of	1935-					1935-				
of Plot	Plant	1938	1939	1940	1941	Total	1938	1939	1940	1941	Total
Exclosure	Alive	174	42	32	22	270	32	18	26	22	98
	Dead	2	0	0	0	2	6	8	4	0	18
Control	Alive	198	29	35	31	293	27	6	3	5	41
	Dead	4	0	0	0	4	1	2	0	0	3

It seems quite evident that sheep have caused neither an increase nor a decrease in pine seedlings. On the other hand, ribes seed within the exclosure have germinated at a rate of three to nine times that for the control. New seedlings observed on the control are becoming established in the protection of some obstacle such as a log or stump, or beneath brush. Those that are germinating within the exclosure are found generally distributed over the entire plot. There is every reason to believe that the deferment of grazing has favored the appearance of many new ribes seedlings. It is likely that the continued disturbance caused by the trampling of sheep either creates an unfavorable medium for germination, or few seed are left near the soil surface long enough to germinate. In either case the results so far obtained from this investigation show that on the better ribes sites deferred grazing has increased the number of new seedlings over the area that remains open to grazing.

For the 98 ribes bushes alive within the exclosure average measurements per bush are as follows: height, .49 feet; live stem, .73 feet; number of main stems, 1.04; number of laterals, 1.16; and 10.08 leaves per bush. For the 41 alive bushes on the control average measurements per bush were found to be: height, .68 feet; live stem, 1.21 feet; number of main stems, 1.07; number of laterals, 3.17; and 18.54 leaves per bush. Although the morphological differences are not marked, an average bush on the control is commencing to show the development of a few more leaves and laterals on stems devoid of terminal buds, than will be found on a comparable bush within the exclosure.

The area surrounding plot 7 represents a full southern aspect with surface soils drying early in July. Fewer plant species of a palatable nature are present and the bulk of the vegetative population tends toward the more site-tolerant species such as huckleberry and thimbleberry. The results of two seasons study are shown in table 12.

STATUS OF RIBES AND WHITE PINE SEEDLINGS AFTER TWO YEARS MIDSUMMER GRAZING (PLOT 8, NORTH EXPOSURE, CLEARWATER FOREST)

TABLE 12

	Status	by		ber P: r of (		ı	Number Ribes by Year of Origin					
Туре	of	1935-					1935-					
of Plot	Plant	1938	1939	1940	1941	Total	1938	1939	1940	1941	Total	
Tyelogune	Alive	420	84	28	18	550	29	8	2	4	43	
Exclosure	Dead	14	5	0	0	19	6	0	0	0	6	
Control	Alive	429	49	32	25	535	32	6	5	1	44	
001101101	Dead	- 8	2	0	0	10	4	0	2	0	6	

The number of pine seedsgerminating within the exclosure and those on the control have been about equal. The large number of white pine seed trees in the vicinity of plot 8 has maintained a large seed supply, and has resulted in a heavier germination than on plot 7. Pine seedlings are becoming established on this area with smaller losses than those recorded for ribes. Responsible for this may be the ability of pine seedling roots to penetrate

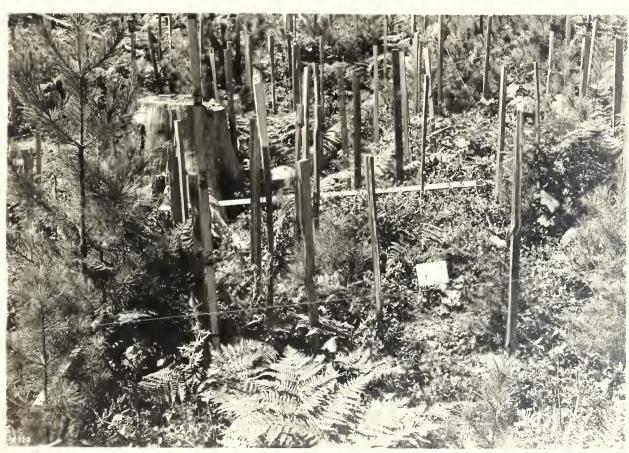
vertically at a more rapid rate of development and at an earlier date in the season than can roots of ribes. All of the pine seedlings found dead on this area, and also on plot 6, were killed by blister rust.

The number of ribes germinating within the exclosure and on the control has been about evenly divided for the years of germination. Two ribes were found to have been removed by the action of sheep on the control. It would appear that since the upper soil layer dries early in summer, the site is naturally unfavorable for any amount of ribes seed germination. On the most favorable sites such as represented by plot 6, it was observed that soil kept in a loose state on the control dried much faster than the same soil zone within the exclosure, consequently the greater germination occurred where the heavier moisture content prevailed and remained over a longer period of the season.

For the 43 ribes bushes alive within the exclosure, average measurements per bush are as follows: height, .61 feet; live stem, 1.58 feet; number of main stems, 1.51; number of laterals, 2.79; and 15.42 leaves per bush. For the 44 bushes alive on the control, average measurements per bush were found to be: height, .63 feet; live stem, 1.07; number of main stems, 1.39; number of laterals, 2.71; and 14.59 leaves per bush. At this early date no significant morphological differences between ribes bushes on the protected area and those on the control would be found.

The two photographs, W 106 and W 120 exhibited as Plate 1 show the type of exclosure constructed and conditions surrounding plot 7. The stakes with white tops mark the location of ribes and the plain cedar stakes mark the location of white pine seedlings. Stakes three to four inches above the ground level have been used for seedlings on the area being grazed in order not to interfere with the normal movement of sheep.





Plot deferring grazing from cutover land with grazed check plot adjacent (W 106) and a detailed perspective of a milacre subplot within exclosure (W 120). Stakes with painted tops mark ribes; unpainted mark white pine.



# PHOTOGRAPHIC AND EDUCATIONAL WORK, 1941 By Edward L. Joy, Forester H. Miller Cowling, Chief Scientific Aid

During 1941 photographic and educational work included activities on a wide variety of subjects. Photographic department work covered still and moving picture making in both monochrome and color, laboratory processing, Multilith, black-line printing, mimeograph reproducing, drafting and motion picture production. Many of these services are provided for both the Northwestern and the Sugar Pine Regions. In addition, the office of Pear Psylla Control, the Army, and to a lesser extent other agencies, were rendered assistance in photography and machine duplication.

The educational work, which is a joint undertaking of all members of the technical staff, included the use of lectures, both with and without slides; slides giving the blister rust story in automatic and continuous projection; the motion picture on blister rust; pamphlets; posters; preserved specimens of the rust; photographs; and news items. Of these the moving picture, which was shown in revised form after midyear, was used most extensively.

The following reports give detailed information on the work of each of these projects:

## A. Photographic Section

The photographic section has as its major objectives: (1) The maintenance of a pictorial record of control and investigative work. (2) The provision of photographs, maps, charts, manuals and other material necessary to facilitate the conduct and reporting of field work. (3) The production of illustrative material for educational purposes. Added to this in 1941 was the work of producing materials for military establishments in connection with national defense.

All types of regular work outlined in the objectives of this department were performed in 1941. In spite of the fact that the continuous rains of the year greatly reduced the usual amount of time favorable for field photography, all urgent pictures for the Northwestern Region were secured. Laboratory work included the reproduction of maps, charts, reports and other items for both field and office uses. For educational work the production of natural color lantern slides and motion pictures, and photographs was continued.

In 1941 greater use was made of the Multilith machine for reproducing various material in both black and white and color. Forms, tables, graphs, charts, maps and photographs are included. Examples of this type of work, with special reference to multicolored maps, are to be found in this and the 1940 volumes of "Blister Rust Control Work in the Far West."

The black-line printing machine continued to serve well the needs of this agency and the Pear Psylla Control unit in producing large numbers of maps for field and report uses. Pear Psylla Control, due to an expanded program,

required even a larger quantity of maps than in 1940, most of which were produced by their operator. Color photography for both lantern slides and motion pictures was again used to a large extent. Of particular interest and value were motion pictures made with the micro attachment showing magnifications of the various stages of rust development. These became an important addition to the film, "The Story of White Pine Blister Rust," the revision of which was accomplished during the first part of the year.

During the year the mimeographing machine was added to the equipment of this unit. Its operation was handled jointly by photographic and stenographic personnel, depending on the availability of an operator. This piece of equipment was also used for Pear Psylla Control work, most of which was produced by their operator.

The summary of 1941 reproduction work by photographic and machine methods, including that done by other agencies, is given in the following table:

PHOTOGRAPHIC, MULTILITH, BLACA-LINE AND MIMEOGRAPH WORK

		Northwestern	Sugar Pine	Other	
	Item	Region	Region	Agencies	Total
		PHOTOGRAPHIC			
Lantern slie	les, black & white	10		11	21
	natural color	96			96
Films, deve	loped, field films	164			164
Copies,	5x7			72	72
	ax10	221	24	117	362
Printing,	4x5 or smaller		200	15	215
	5x7	959	10		969
	9xll	1,566	2,460	98	4,124
Enlarging,	llx14 or smaller	23	24	146	193
	16x20	11	96	180	287
	30x40	10			10
Movie Tilm,	50 ft. rolls	2			2
	100 ft. rolls	8		1	9
Total Items		3,070	2,314	640	6,524
		MULTILITH			
Copies		94	6	35	135
Plates made		141	11	56	208
Cards print		2,000	3,000	59,000	64,000
Cards print	ed, reverse		3,000	31,000	34,000
Total cards		2,000	6,000	90,000	98,000
Paper print	ed	98,600	15,700	248,500	362,800
Paper print	ed, reverse	20,000	6,000	41,500	67,500
Total paper		118,600	21,700	290,000	430,300
Total Items		120,835	27,717	380,091	528,643
	BLA	CK-LINE PRINT			
Total maps,	printed	786	16	2,867	3,669
		MIMEOGRAPH			
Total paper		42,880			42,380
Grand Total	All Items	167,571	30,547	333,598	581,716

### B. Educational Section

The demands for informational and instructional material pertaining to blister rust and its control appear to be reasonably well cared for by such media as those used at present. These include bulletins, posters, pictures, lantern slides, motion pictures, lectures and preserved specimens. During 1941 the year-old, locally produced motion picture was thoroughly revised to include scenes that were not available in 1940 and to improve sequence and timing. The result brought favorable comment and a wider usage, especially for worker training and educational purposes. A further improvement, that should be accomplished with the next revision, will be the addition of sound.

To provide informational and educational material where and when it is desired is a joint undertaking by all members of the staff. During the period of worker training every usable medium is made available. Beyond this the high schools and colleges receive considerable attention in connection with their science courses. A third field includes groups such as clubs and societies and the individuals who call or write for material.

There follows a brief summary of the range of use in 1941 of the material listed:

1. Bulletins, posters and specimens. Bulletins issued in 1941 were the same as those used in the preceding two years. Numbering about ten, these cover the field of blister rust and its control quite thoroughly, although some are becoming obsolete. Other items, used with the bulletins, are the poster and a letter-size spread map for the United States. The total of all bulletins, posters and maps distributed in 1941 was approximately 1,000.

The preserved specimens used in 1941, although from stock several years old, served satisfactorily for every request. These include specimens in 6" x 9" display boxes and bulk specimens in jars. Included in the total of 24 pints of infected leaves and two quarts and 60 tubes of cankers that were sent were orders for the Universities of California and Colorado.

- 2. Talks, slides and motion picture. Very few talks on blister rust, except the question and answer type following the blister rust movie showing, were given in 1941. Although lantern slides are still used occasionally, the motion picture continued for the second year as the most desired feature. Following the film's revision it was in even greater demand than before. Two copies are used by the Bureau and one by the Forest Service. Although no record of Forest Service showings is available, the Bureau prints of both the original and the revised editions were projected 43 times to a total of 2,081 people.
- 3. Fairs and exhibits. During 1941 only the Bonner County Fair at Sandpoint, Idaho, had a blister rust exhibit. This was a Forest Service display for which this office provided materials. In addition, the blister rust film was used along with other forest films in a tent showhouse operated by the Forest Service. For 1942 the blister rust diorama will be available as a new fair feature.

4. General publicity. Occasional news items on the blister rust work appeared in papers of this region during 1941. One full page feature story prepared by a WPA writer to depict the part of the WPA in blister rust control appeared in a Spokane paper. This office assisted in this instance by providing some factual data and pictures.

APPENDIX



TABLE 1

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL CALENDAR YEAR 1941, REGULAR APPROPRIATIONS

	Project	Salaries	Expense	Total
	January 1 to June 30, 1941			
3.2	Cooperative Ribes Eradication on Federal Lands			
	3.21-2 - Cabinet National Forest, Montana	\$ 1,350.00	\$ 120.17	\$ 1,470.17
	3.22 - Method Studies of Ribes Eradication, Idaho	1,382.06		1,383.56
3.3	Cooperative Ribes Eradication on National Parks			
	3.31 - Glacier National Park, Montana		91.24	
	3.33-1 - Mount Rainier National Park, Washington		49.64	49.64
3.4	Cooperative Ribes Eradication on State and Private Lands			
	3.42-1 - Clearwater Operation, Idaho	4,975.06	2,124.21	
	3.42-2 - St. Joe Operation, Idaho	6,734.84		10,191.83
	3.42-3 - Coeur d'Alene Operation, Idaho	1,350.00		1,350.00
	3.42-4 - Kaniksu Operation, Idaho		2,263.93	
	3.42-5 - Mount Spokane Operation, Idaho	825.00		
	3.43-2 - Mount Spokane Operation, Washington	825.00	2.43	827.43
4.1	Field Studies, Spread of the Rust			1
	4.12 - Idaho	3,249.96		
	4.13 - Washington		10.00	
	Educational Work	1,650.00	16.09	1,666.09
9.				
	9.1 - Supervision	4,299.96	248.71	4,548.67
	9.2 - Office Maintenance and	8,641.85	930.84	9,572.69
	9.3 - Miscellaneous Expenses			<u> </u>
-	Grand Total January 1 to June 30, 1941	\$38,723.13	\$9,710.25	\$48,433.38
-	July 1 to December 31, 1941	T .		
1.	Planning Coordination and Technical Direction	1 500 00	386 86	1 606 06
	1.1 - Clearwater Operation, Idaho	1,500.00		
	1.2 - St. Joe Operation, Idaho	2,124.98		
	1.3 - Coeur d'Alene Operation, Idaho 1.4I - Kaniksu Operation, Idaho	1,387.49	RCA EA	1,387.49
	1.4I - Kaniksu Operation, Idaho 1.5I - Mount Spokane Operation, Idaho			
	1.5W - Mount Spokane Operation, Idaho 1.5W - Mount Spokane Operation, Washington	550.00 296.11		
	1.6C - Cabinet Operation, Montana	1,350.00		
1	1.7G - National Park, Glacier	275.00		
	1.7GT - National Park, Grand Teton	197.57		
	1.7R - National Park, Mount Rainier	825.00		
	1.7Y - National Park, Yellowstone	395.18		
	1.A - Office Maintenance		1,219.20	
	1.B - Supervision	4,067.75		
	1.C - Education and Information	1,986.00		
	1.D - Control Investigations	3,698.27		
	1.E - Methods Development	195.00		197.51
	Total, Project 1, July 1 to December 31, 1941	\$28,260.73	\$3 266 24	\$31,526.97
3.	Cooperative Ribes Eradication on State and Private Lands	<del>4</del> ~0,200.75	₩U, &UU. &4	AOT,020.21
"	3.1 - Clearwater Operation, Idaho	1,500.00	628.01	2,128.01
	3.2 - St. Joe Operation, Idaho	2,058.32		
	3.4 - Kaniksu Operation, Idaho	1,282.60		
	Total, Project 3, July 1 to December 31, 1941			\$ 6,810.78
Ь	10001, 110,000 b, cutj 1 00 bocombol ol, 1341	W 1,010.32	AT1202.00	W 0,010.78



# FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL

JANUARY 1 TO JUNE 30, 1941 401087-651999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE FEDERAL NON-CONSTRUCTION PROJECTS (TRANSFER FROM W.P.A.) 1941

8.22 - Method Studiee of Ribee Eradication   8.42-1 - Cooperative Ribee Eradication, Clearwater Operation   4,795.52   3,130.84   7,926.3     8.42-2 - Cooperative Ribee Eradication, St. Joe Operation   4,253.05   3,325.38   7,578.4     8.42-3 - Cooperative Ribee Eradication, Coeur d'Alene Operation   117.84   103.65   221.4     8.42-4 - Cooperative Ribee Eradication, Kanikeu Operation   18,697.45   3,213.08   21,910.5     8.42-5 - Cooperative Ribee Eradication, Mount Spokane Operation   2,904.13   1,093.09   3,997.2     8.6 - Educational Work   225.10   225.1     8.9-1 - Supervision   -40.03*   -40.0     8.9-2 - Spokane Office Maintenance and   8.9-3 - Miscellaneous Expensee   117.84   5,451.21   5,569.0     Total 101-2-92-7, Idaho   31,557.11   16,617.14   48,174.2     101-2-93-17, Washington   1,584.24   1,584.2     8.33-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   12.5     8.43-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   12.5     8.43-1 - Cooperative Ribee Eradication, Mount Spokane Operation   96.76   96.7     8.43-2 - Cooperative Ribee Eradication, Mount Spokane Operation   593.43   55.47   648.9     8.9-1 - Supervision   18.75   18.7     8.6 - Educational Work   593.43   55.47   648.9     8.9-1 - Supervision   18.75   18.7     8.9-2 - Spokane Office Maintenance and   8.9-3 - Miscellaneous Expensee   3,910.31   691.03   4,601.3     8.9-3 - Miscellaneous Expensee   Total 101-2-93-17, Washington   8,278.11   867.59   9,145.7				
8.12 - Field Studiee, Pine Dieesee Survey	Project	Salariee	Expense	Total
8.22 - Method Studiee of Ribee Eradication	101-2-92-7, Ideho			
8.42-1 - Cooperative Ribee Eradication, Clearwater Operation 4,795.52 3,130.84 7,926.3 8.42-2 - Cooperative Ribee Eradication, St. Joe Operation 4,253.05 3,325.38 7,576,4 8.42-3 - Cooperative Ribee Eradication, Coeur d'Alene Operation 117.84 103.65 221.4 8.42-4 - Cooperative Ribee Eradication, Kenikeu Operation 18,697.45 3,215.08 21,910.5 8.42-5 - Cooperative Ribee Eradication, Mount Spokene Operation 2,904.13 1,093.09 3,997.2 8.6 - Educational Work 225.10 225.10 225.10 8.9-1 - Supervision -40.03* -40.03* -40.0 8.9-2 - Spokene Office Maintenance and 117.84 5,451.21 5,569.0 8.9-2 - Spokene Office Maintenance and 117.84 5,451.21 5,569.0 117.84 5,451.21 5,451.21 5,451.21 5	8.12 - Field Studiee, Pine Dieease Survey	\$ 671.28	\$ 59.82	\$ 731.10
8.42-2 - Cooperative Ribee Eradication, St. Joe Operation   4,253.05   3,325.38   7,578.4   8.42-3 - Cooperative Ribee Eradication, Coeur d'Alene Operation   117.84   103.65   221.4   8.42-4 - Cooperative Ribee Eradication, Kenikeu Operation   18,697.45   3,213.08   21,910.5   8.42-5 - Cooperative Ribee Eradication, Mount Spokane Operation   2,904.13   1,093.09   3,997.2   8.6 - Educational Work   225.10   225.1   8.9-1 - Supervieton   -40.03*   -40.0   8.9-2 - Spokane Office Maintenance and   117.84   5,451.21   5,569.0   8.9-3 - Miscellaneous Expensee   117.84   5,451.21   5,569.0   Total 101-2-92-7, Idaho   31,557.11   16,617.14   48,174.2   8.13 - Field Studiee, Pine Disease Survey   1,584.24   1,584.2   8.33-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   12.5   8.43-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   2,183.1   8.43-2 - Cooperative Ribee Eradication, Mount Spokane Operation   96.76   96.7   8.43-2 - Cooperative Ribee Eradication, Mount Spokane Operation   2,093.37   89.77   2,183.1   8.6 - Educational Work   593.43   55.47   648.9   8.9-1 - Supervision   18.75   18.7   8.9-2 - Spokane Office Maintenance and   3,910.31   691.03   4,601.3   8.9-3 - Miscellaneous Expensee   Total 101-2-93-17, Washington   8,278.11   867.59   9,145.7   Grand Total January 1 to June 30, 1941   \$39,835.22 \$17,484.73   \$57,319.9    401008-651999 EMERGENCY RELIEF, AURICULTURE   ALMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941	8.22 - Method Studies of Ribes Eradication		55.00	55.00
B.42-3 - Cooperative Ribee Eradication, Coeur d'Alene Operation   117.84   103.65   221.4   B.42-4 - Cooperative Ribee Eradication, Kenikeu Operation   18,697.45   3,213.08   21,910.5   B.42-5 - Cooperative Ribee Eradication, Mount Spokene Operation   2,904.13   1,093.09   3,997.2   B.6 - Educational Work   225.10   225.1   B.9-1 - Supervicion   -40.03*   -40.0   B.9-2 - Spokene Office Maintenance and   117.84   5,451.21   5,569.0   B.9-3 - Miscellaneous Expensee   117.84   5,451.21   5,569.0   Total 101-2-92-7, Idaho   31,557.11   16,617.14   48,174.2   B.33-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   12.5   B.43-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   12.5   B.43-2 - Cooperative Ribee Eradication, Mount Spokene Operation   96.76   96.7   B.43-2 - Cooperative Ribee Eradication, Mount Spokene Operation   593.43   55.47   648.9   B.9-1 - Supervicion   18.75   18.7   B.6 - Educational Work   593.43   55.47   648.9   B.9-2 - Spokene Office Maintenance and   8.9-3 - Miscellaneous Expensee   3,910.31   691.03   4,601.3   B.9-3 - Miscellaneous Expensee   7 total 101-2-93-17, Washington   8,278.11   867.59   9,145.7   Grand Total January 1 to June 30, 1941   \$39,835.22 \$17,484.73   \$57,319.9    401008-651999 EMERGENCY RELIEF, ACRICULTURE   ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941	8.42-1 - Cooperative Ribee Eradication, Clearwater Operation	4,795.52	3,130.84	7,926.36
B.42-4 - Cooperative Ribee Eradication, Kanikeu Operation   18,697.45   3,213.08   21,910.5   B.42-5 - Cooperative Ribee Eradication, Mount Spokene Operation   2,904.13   1,093.09   3,997.2   B.6 - Educational Work   225.10   225.11   B.9-1 - Supervision   -40.03*   -40.03   -40.03   B.9-2 - Spokene Office Maintenance and   117.84   5,451.21   5,569.0   B.9-3 - Miscellaneous Expensee   117.84   5,451.21   5,569.0   Total 101-2-92-7, Idaho   31,557.11   16,617.14   48,174.2   B.13 - Field Studies, Pine Disease Survey   1,584.24   1,584.2   B.33-1 - Cooperative Ribee Eradication, Mount Rainier National Park   12.57   12.5   B.43-1 - Cooperative Ribee Eradication, Mount Spokene Operation   96.76   96.7   B.43-2 - Cooperative Ribee Eradication, Mount Spokene Operation   2,093.37   89.77   2,183.1   B.6 - Educational Work   593.43   55.47   648.9   B.9-1 - Supervision   18.75   18.7   B.9-2 - Spokene Office Maintenance and   3,910.31   691.03   4,601.3   B.9-3 - Miscellaneous Expensee   3,910.31   691.03   4,601.3   Total 101-2-93-17, Washington   8,278.11   867.59   9,145.7   Grand Total January 1 to June 30, 1941   \$39,835.22   \$17,484.73   \$57,319.9    401008-651999 EMERGENCY RELIEF, ACRICULTURE   ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941	8.42-2 - Cooperative Ribee Eradication, St. Joe Operation	4,253.05	3,325.38	7,578.43
S.42-5 - Cooperative Ribee Eradication, Mount Spokene Operation   2,904.13   1,093.09   3,997.2	8.42-3 - Cooperative Ribee Eradication, Coeur d'Alene Operation	117.84	103.65	221.49
8.6 - Educational Work 8.9-1 - Supervieton 8.9-2 - Spokane Office Maintenance and 8.9-3 - Miscellaneoue Expensee  Total 101-2-92-7, Idaho 31,557.11 16,617.14 48,174.2  101-2-93-17, Washington 8.13 - Field Studies, Pine Disease Survey 8.33-1 - Cooperative Ribes Eradication, Mount Rainier National Park 8.43-1 - Cooperative Ribes Eradication, Mount Spokane Operation 8.43-2 - Cooperative Ribes Eradication, Mount Spokane Operation 8.43-2 - Cooperative Ribes Eradication, Mount Spokane Operation 8.9-3 - Educational Work 8.9-1 - Supervision 8.9-2 - Spokane Office Maintenance and 8.9-3 - Miscellaneous Expensee  Total 101-2-93-17, Washington 8.9-3 - Miscellaneous Expensee  401008-651999 FMERGENCY RELIEF, ACRICULTURE ALMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Washington 8.6 - Educational Work 5.96 5.9	8.42-4 - Cooperative Ribee Eradication, Kanikeu Operation	18,697.45	3,213.08	21,910.53
8.9-1 - Supervision 8.9-2 - Spokane Office Maintenance and 8.9-3 - Miccellaneoue Expensee	8.42-5 - Cooperative Ribee Eradication, Mount Spokane Operation	2,904.13	1,093.09	3,997.22
8.9-2 - Spokene Office Maintenance and 8.9-3 - Miscellaneous Expenses  Total 101-2-92-7, Idaho 31,557.11 16,617.14 48,174.2  101-2-93-17, Washington 8.13 - Field Studies, Pine Disease Survey 1,584.24 1,584.24 8.33-1 - Cooperative Ribes Eradication, Mount Rainier National Park 8.43-1 - Cooperative Ribes Eradication, Keniksu Operation 96.76 96.7 8.43-2 - Cooperative Ribes Eradication, Mount Spokane Operation 2,093.37 89.77 2,183.1 8.6 - Educational Work 593.43 55.47 648.9 8.9-1 - Supervision 18.75 18.7 8.9-2 - Spokane Office Maintenance and 3,910.31 691.03 4,601.3 8.9-3 - Miscellaneous Expenses  Total 101-2-93-17, Washington 8,278.11 867.59 9,145.7  Grand Total January 1 to June 30, 1941 \$39,835.22 \$17,484.73 \$57,319.9  401008-651999 EMERGENCY RELIEF, ACRICULTURE ALMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Washington 8.6 - Educational Work 5.96 5.9	8.6 - Educational Work		225.10	225.10
8.9-3 - Miccellaneoue Expenses Total 101-2-92-7, Idaho 31,557.11 16,617.14 48,174.2  101-2-93-17, Washington 8.13 - Field Studies, Pine Disease Survey 1,584.24 1,584.24 8.33-1 - Cooperative Ribes Eradication, Mount Rainier National Park 8.43-1 - Cooperative Ribes Eradication, Mount Spokane Operation 96.76 96.7 8.43-2 - Cooperative Ribes Eradication, Mount Spokane Operation 2,093.37 89.77 2,183.1 8.6 - Educational Work 593.43 55.47 648.9 8.9-1 - Supervision 18.75 18.7 8.9-2 - Spokane Office Maintenance and 3,910.31 691.03 4,601.3 8.9-3 - Miscellaneous Expenses Total 101-2-93-17, Washington 8,278.11 867.59 9,145.7 Grand Total January 1 to June 30, 1941 \$39,835.22 \$17,484.73 \$57,319.9  401008-651999 FMERGENCY RELIEF, ACRICULTURE ALMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Washington 8.6 - Educational Work 5.96 5.9			-40.03*	-40.03
101-2-93-17, Waehington		117.84	5,451.21	5,569.05
8.13 - Field Studiee, Pine Dieeaee Survey	Total 101-2-92-7, Idaho	31,557.11	16,617.14	48,174.25
8.43-1 - Cooperative Ribee Eradicetion, Kaniksu Operation   96.76   96.7     8.43-2 - Cooperative Ribee Eradication, Mount Spokane Operation   2,093.37   89.77   2,183.1     8.6 - Educational Work   593.43   55.47   648.9     8.9-1 - Supervieton   18.75   18.7     8.9-2 - Spokane Office Maintenance and   3,910.31   691.03   4,601.3     8.9-3 - Miccellaneous Expeneee   3,910.31   691.03   4,601.3     Total 101-2-93-17, Washington   8,278.11   867.59   9,145.7     Grand Total January 1 to June 30, 1941   \$39,835.22 \$17,484.73   \$57,319.9     401008-651999 EMERGENCY RELIEF, ACRICULTURE   ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941     101-9-00-1, Washington   8.6 - Educational Work   5.96   5.9	8.13 - Field Studiee, Pine Dieeaee Survey	1,584.24		1,584.24
8.43-2 - Cooperative Ribee Eradication, Mount Spokane Operation   2,093.37   89.77   2,183.1     8.6	8.33-1 - Cooperative Ribee Eradication, Mount Rainier National Park		12.57	12.57
8.6 - Educational Work 593.43 55.47 648.9 8.9-1 - Supervieton 18.75 18.7 8.9-2 - Spokane Office Maintenance and 3,910.31 691.03 4,601.3 8.9-3 - Miccellaneous Expeneee 3,910.31 691.03 4,601.3  Total 101-2-93-17, Wachington 8,278.11 867.59 9,145.7  Grand Total January 1 to June 30, 1941 \$39,835.22 \$17,484.73 \$57,319.9  401008-651999 FMERGENCY RELIEF, ACRICULTURE ALMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Wachington 8.6 - Educational Work 5.96 5.9				96.76
8.9-1 - Supervision 8.9-2 - Spokane Office Maintenance and 8.9-3 - Miccellaneous Expensee  Total 101-2-93-17, Washington 8,278.11 867.59 9,145.7  Grand Total January 1 to June 30, 1941 \$39,835.22 \$17,484.73 \$57,319.9  401008-651999 EMERGENCY RELIEF, ACRICULTURE ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Washington 8.6 - Educational Work 5.96 5.9	8.43-2 - Cooperative Ribee Eradication, Mount Spokane Operation	2,093.37	89.77	2,183.14
8.9-2 - Spokane Office Maintenance and   8.9-3 - Miecellaneous Expeneee   Total 101-2-93-17, Waebington   8,278.11   867.59   9,145.7     Grand Total January 1 to June 30, 1941   \$39,835.22 \$17,484.73 \$57,319.9     401008-651999 EMERGENCY RELIEF, AGRICULTURE ALMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941     101-9-00-1, Waebington   8.6 - Educational Work   5.96   5.9	8.6 - Educational Work	593.43	55.47	648.90
8.9-3 - Miecellaneous Expeneee  Total 101-2-93-17, Waehington  Grand Total January 1 to June 30, 1941  401008-651999 EMERGENCY RELIEF, AGRICULTURE ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Waehington 8.6 - Educational Work  5.96 5.9			18.75	18.75
Grand Total January 1 to June 30, 1941 \$39,835.22 \$17,484.73 \$57,519.9  401008-651999 EMERGENCY RELIEF, ACRICULTURE ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Waehington 8.6 - Educational Work 5.96 5.9		3,910.31	691.03	4,601.34
Grand Total January 1 to June 30, 1941 \$39,835.22 \$17,484.73 \$57,319.9  401008-651999 EMERGENCY RELIEF, AGRICULTURE ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Washington 8.6 - Educational Work 5.96 5.9	Total 101-2-93-17, Washington	8,278,11	867.59	9,145.70
ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941  101-9-00-1, Washington 8.6 - Educational Work 5.96 5.9	Grand Total January 1 to June 30, 1941		\$17,484.73	\$57,319.95
8.6 - Educational Work 5.96 5.9	ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.			
			5.65	
8.9-1 - Supervieton   35.94   35.9				
O O O Challena Occiona Nodata Nodata and			35.94	35.94
8.9-3 - Miecellaneoue Expenses	8.9-3 - Miecellaneoue Expenses			4,077.15
Total Administrative, 401008 \$ 2,031.79 \$ 2,087.26 \$ 4,119.0	m-t-1 Ad-d-d-t-t 401000	₱ 9 031 7Q	₱ 2 097 26	& 4 119 A5

<sup>\*</sup>Vouchere covering operation of passenger car paid during previoue calendar year transferred to regular funds in June, 1941.

#### TABLE 3

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL

JULY 1 TO DECEMBER 31, 1941

801085-652999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE
FEDERAL NON-CONSTRUCTION PROJECTS CONTINUED, (TRANSFER FROM W.P.A.) 1942 - DECEMBER 31, 1941

Project	Salariee	Expense	Total
201-2-92-16, Idaho			
8.1 - Cooperative Ribee Eradication, Clearwater Operation	\$ 5,176.36	\$ 1,304.90	\$ 6,481.2
8.2 - Cooperative Ribes Eradication, St. Joe Operation	5,803.68		
8.3 - Cooperative Ribee Eradication, Coeur d'Alene Operation		133.20	133.2
8.4I - Cooperative Ribee Eradication, Kaniksu Operation	23,830.53	2,881.99	26,712.5
8.51 - Cooperative Ribes Eredication, Mount Spokane Operation	4,787.11	479.45	5,266.5
8.A - Office Maintenance		1,196.18	1,196.1
8.B - Supervision		13.40	13.4
8.C - Education and Information		81.99	81.9
8.D - Control Inveetigations		123.33	123.3
8.E - Methode Development		14.50	14.5
Total 201-2-92-16, Idaho	39,597.68	7,943.83	47,541.5
201-2-93-60, Waehington			
8.4W - Cooperative Ribes Eradication, Kaniksu Operation	547.80	172.13	719.9
8.5W - Cooperative Ribee Eradication, Mount Spokane Operation	7,874.13	1,484.02	9,358.1
8.7R - Cooperative Ribee Eradication, Mount Rainier National Park		43.00	43.0
8.A - Office Maintenance	446.40	442.07	888.4
8.C - Education and Information		97.84	97.8
8.D - Control Inveetigatione	440.91	19.00	459.9
Total 201-2-93-60, Waehington	9,309.24	2,258.06	11,567.3
Grand Total July 1 to December 31, 1941, 801085	\$48,906.92	\$10,201.89	\$59,108.8
801006-652999 EMERGENCY RELIEF, AGRICULTURE, CONTINUATION OF ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1942 - 1	OF EXISTING DECEMBER 31	PROJECTS,	
201-9-00-1, Administrative		,,,	
8.A - Office Maintenance	2,274.96	174.23	2.449.1
8.C - Education and Information		69.42	
8.7R - Cooperative Ribee Eradication, Mount Rainier National Park		39.00	
Total Administrative, 801006	\$ 2,274.96		\$ 2,557.6

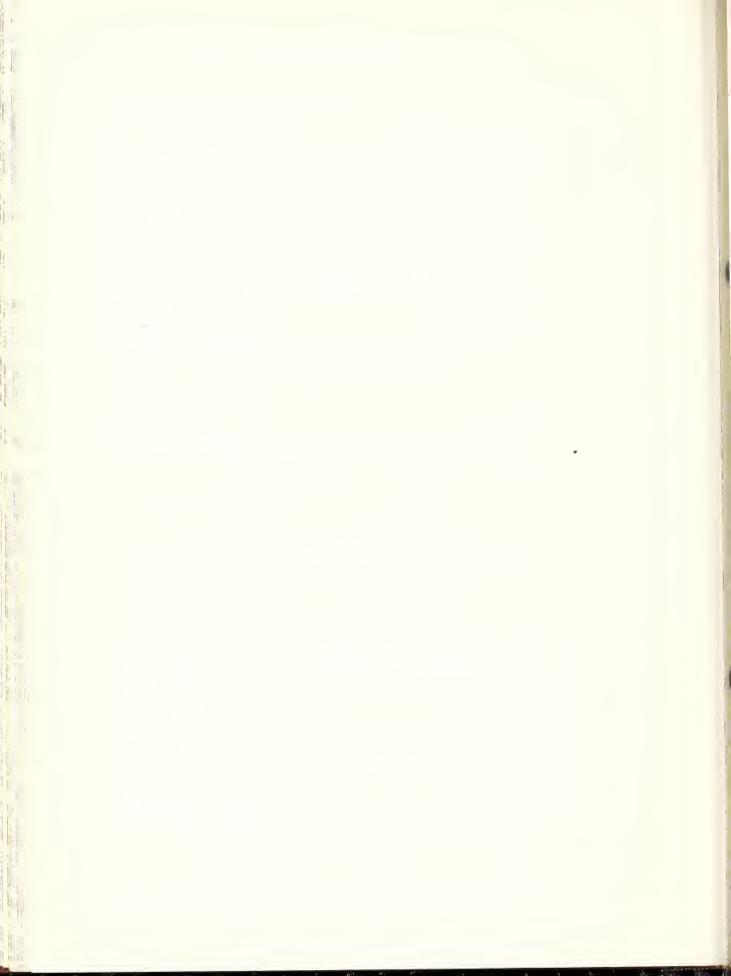


TABLE 4

SUMMARY OF EXPENDITURES FROM STATE AND PRIVATE FUNDS
1928 - 1941 IDAHO

Year	State	Private	Total
1928	\$ 2,518.55	\$ 2,264.32	\$ 4,782.87
1929		19,027.66	19,027.66
1930		20,000.00	20,000.00
1931	5,000.00	35,905.32	40,905.32
1932	8,003.43	11,186,33	19,189.76
1933			
1934	29,154.06		29,154.06
1935	15,000.00		15,000.00
1936	16,998.25		16,998.25
1937	15,001.25		15,001.25
1938	15,000.44		15,000.44
1939	15,438.04		15,438.04
1940	10,034.48		10,034.48
1941	7,542.73	15,756.40	23,299.13
Total	\$139,691.23	\$104,140.03	\$243,831.26



TABLE 5

SUMMARY OF FEDERAL EXPENDITURES BY ACTIVITIES, NORTHWESTERN REGION BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE 1941

upervision	\$23,334.04 9.31	23,343,35	4,741.77	3,363,62	18,75	3,382.37	31,439,43	28.06	31,467.49		31,439,43	28.06	\$31,467.49
Canker and In- Mis- Supervision Cellaneous Supervision	\$2,583.27 \$13,670.57 3	25,929.86	2,929.35	2,929.35	6,522.09	9,451.44	19,529.27	18,781,38	38,310.65		19,529.27	18,781.38	\$97,720.27 \$1,650.57 \$833.69 \$10,080.94 \$1,153.69 \$23,568.17 \$5,091.08 \$38,310.65 \$31,467.49
Education and In- formation	\$2,583.27 307.09	2,890.36	684.30	694.30	822,12	1,516.42	3,961.87	1,129.21	5,091.08		3,961.87	23,568.17 1,129.21 18,781.38	\$5,091.08
Canker Elimination	\$19,739.66	19,739.56			3,828.51	3,828.51		23,568,17	23,568.17			23,568.17	\$23,568.17
Disease Survey	909.01 854.43 \$1,153.69	1,153.69						1,153.69	1,153.69			2,898.58 1,153.69	\$1,153.69
Control Investi- gation	\$ 5,909.01 854.43	6,763.44	99.929	69*929	2,044,15	2,680.84	7,182.36	2,898,58	10,080.94		7,182,36	2,898,58	\$10,080.94
Pre- Eradi- cation										\$833.69	833.69		\$833.69
Methods Develop- ment	\$1,383.56 69.50	1,453.06	98.75	98.76		98.76	1,581.07	69.50	1,650.57		1,581.07	69.50	\$1,650.57
Ribes	\$22,243.44 \$1,383.56 66,852.79 69.50	89,096.23			8,624.04	8,624.04	22,243.44	75,476,83	97,720.27		22,243.44	75,476.83	\$97,720.27
Appro- Total Ribes briation	\$ 69,123.89 101,245.76	170,369.65	8,090,83	7,722.72	21,859,66	29,582,38	85,937.44	123,105,42	209,042,86	833.69	86,771.13	123,105.42	\$209,876.55
Appro- priation	Regular ERA	Total	Regular	Regular	ERA	Total	Regular	ERA	Total	Regular	Regular	ERA	Total
State	Idaho		Montana		Washington		Total	Western White ERA	Pine Region	Wyoming	Total	Northwestern	Region



TABLE 1 SUMMARY OF 1941 RIBES ERADICATION

			dication W				cation Work				Par Cant		
	Acraege	Number Dest	Ribea	Number* 8-Hour	Acreege			Number 8-Hour			r Ribaa	Number 8-Hour	Initial Eradication
Steta	Worked		Cultivated			Dastroyed Wild Cultivated				Daatroyed Wild Cultivated			
Idaho	11,676	2,806,320	-	17,615	41,218	3,767,603	-	48,151	52,894	6,573,923	-	65,766	0.55
Montena	4,579	333,862	-	2,720	2,387	313,899	-	3,374	6,966	647,761	-	6,094	2.35
Weshington	3,970	591,104	-	1,185	7,387	956,992	-	5,220	11,357	1,548,096	-	6,405	2.34
Totel	20,225	3,731,286	-	21,520	50,992	5,038,494	-	56,745	71,217	8,769,780	-	78,265	0.81

<sup>\*</sup>Number 8-hour man-days = hours worked par day x number men

<sup>\*\*</sup>Parcantage of total white pine control acraege in atata that was worked during 1941.

						Number	of Campe			Labo		of Em	oloyeas*	
State	Initiel	Per Acra Reeradication	Initial		C.C.C.				C.C.C. and S.C.S.			Total	All Supervision	Totel Employeas
Idaho	240	91	1.51	1.17	9	6	30	45	252	147	1,095	1,494	88	1,582
Montena	73	132	.59	1.41	2	1	3	6	62	29	90	181	11	192
Washington	149	130	.30	.71	1	l	6	8	35	53	165	253	11	264
Total	184	99	1.06	1.11	12	8	39	59	349	229	1,350	1,928	110	2,038

<sup>\*</sup>Entar the maximum number of persone on the pay roll at the peak of the season. Total number persons employed is not desired because the large turnover in W.P.A. campa would result in an exaggerated figure.

TABLE 1A SUMMARY OF ALL RIBES ERADICATION 1918-1941 (INCLUSIVE)

			Acreaga	Acreaga	Initial Eradicetion Work					
	Total Acreaga	Acraage White Pina	Control Areas (Whita Pina and	Reported Initially		Number	Ribes royed	Number 8-Hour		
Steta a		Worth Protection		Worked	Control Areas		Cultivated h	Man-Deys		
Idaho	2,307,655	2,307,655	2,122,119	1,632,535	1,632,535	319,339,461	-	1,311,903		
Montana	220,740	220,740	194,544	127,860	127,860	16,344,909	-	88,124		
Washington	169,349	169,349	169,349	123,132	123,132	27,867,976	-	102,36		
Subtotal	2,697,744	2,697,744	2,486,012	1,883,527	1,883,527	363,552,346	-	1,502,38		
Colorado	550,000*	206,000*	206,000*	14,859	14,859	410,649	-	6,29		
Wyoming	3,754,000*	307,800*	251,700*	21,760	21,760	1,085,771	-	6,94		
Subtotal	4,304,000	513,800	457,700	36,619	36,619	1,496,420	-	13,23		
Total	7,001,744	3,211,544	2,943,712	1,920,146	1,920,146	365,048,766	-	1,515,62		

<sup>\*</sup>Indefinita

	Acraage Destroyed 8-Hour			Number 8-Hour	Net Acreega Worked in	Total Numbar Deet:	Numbar 8-Hour					Acra Men-Daye Initial Re-	
State a	Workad b	Wild c	Cultivated d	Man-Daye a	Control Areae f	Wild g	Cultivated h	Man-Daya i	Worked*	Eradication	aradication	Eredication	eredication
Idaho	360,481	53,342,571	-	393,783	1,993,016	372,682,032	-	1,705,686	76.93	196	148	.80	1.09
Montana	10,500	1,428,780	-	13,644	138,360	17,773,689	-	101,768	65.72	128	136	. 69	1.30
Waehington	36,620	5,707,996	-	33,649	159,752	33,575,972	-	136,010	72,71	226	156	.83	.92
Subtotal	407,601	60,479,347	- 1	441,076	2,291,128	424,031,693	-	1,943,464	75.77	193	148	.80	1.08
Coloredo	1,962	86,886	-	664	16,821	497,535	-	6,956	7.2	28	44	.42	.34
Wyoming	-	-	-	-	21,760	1,085,771	-	6,940	8.6	50	-	.32	-
Subtotal	1,962	86,886	-	664	38,581	1,583,306	-	13,896	8.0	41	44	.36	.34
Totel	409,563	60,566,233	-	441,740	2,329,709	425,614,999	-	1,957,360	65.23	190	148	.79	1.08

<sup>\*</sup>Percentaga of total white pine control area in atata that been worked initially.



TABLE 2

SUMMARY Or 1941 RIBES ERADICATION BY PROGRAMS (Including All Work - Initial and Recradication)

	Total			Cooperativ		W.P.A. and E.R.A.					
	Acreage Worked (Initial and	Acreaga		r Ribes royed	Number 8-Hour	ACTORGE	Number Ribes Deatroyed		Number 8-Hour		
State	Reeradication)	Worked	Wild	Cultivated	Man-Days	Workad	Wild	Cultivated	Man-Days		
Idaho	52,894	44,693	5,458,528	-	52,166	5,651	639,595	-	7,099		
Montana	6,966	5,934	398,149	-	3,924	557	91,840	-	524		
Washington	11,357	10,233	1,348,321	-	4,891	1,082	169,325	-	1,110		
Total	71,217	60,860	7,204,998	-	60,981	7,290	900,760	-	8,733		

<sup>\*</sup>Include work dona with "Lea" funds.

		E.C.W.	and S.C.S.			To	tals	
		Numbe	er Ribes	Number		Number	r Ribes	Number
	Acreaga		royed	8-Hour	Acreage	Dest	royed	8-Hour
State	Worked	Wild	Wild Cultivated		Worked	Wild	Cultivated	Man-Days
Idaho	2,550	475,800	-	6,501	52,894	6,573,923	-	65,766
Montana	475	157,772	-	1,646	6,966	647,761	-	6,094
Washington	42	30,450	-	404	11,357	1,548,096	-	6,405
Total	3,067	664,022	-	8,551	71,217	8,769,780	-	78,265

TABLE 2A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1941 (INCLUSIVE)

(Initial and Recradication)

	Total*		Regular and	Cooperativ	е		W.P.A. at	nd E.P.A.		
	Acreage Reported			r Ribes	Number			r Ribes	Number	
Stata	Worked (Initial and Raeradication)	Acraage Workad	Wild	royed Cultivated	8-Hour Man-Days	Acreage Worked	Wild	royed Cultivated	8-Hour Man-Daya	
Idaho	1,993,016	549,791	95,441,448	-	423,653	500,970	91,269,072	-	411,890	
Montana	138,360	19,464	2,834,701	-	20,088	57,800	6,300,829	-	41,59	
Washington	159,752	25,341	6,956,530	-	21,087	39,973	13,632,288	-	53,10	
Subtotal	2,291,128	594,596	105,232,679	-	464,828	598,743	111,202,189	-	506,58	
Colorado	16,821	-	-	-	-	16,821	497,535	-	6,95	
Wyoming	21,760	-	-	-	-	21,760	1,085,771	-	6,940	
Subtotal	38,581	-	-	-	-	38,581	1,583,306	-	13,89	
Total	2,329,709	594,596	105,232,679	-	464,828	637,324	112,785,495	-	520,48	

\*This column = column E, Table 1A plus column B, Table 1A, sacond section

State	Acreage Worked	E.C.W. an Number Destro	Ribes	Number 8-Hour Mar-Days	Acraaga Worked	Numbe: Dest:	or N.R.A. r Ribes royad Cultivated	Number 8-Hour Man-Days	Acraage Worked	Total Emerg (W.P.AE. Number Destr	C.WP.W.A. Ribes	Number 8-Hour
Idaho	590,414	123,729,240	-	661,693	351,841	62,242,272	-	208,450	1,443,225	277,240,584	-	1,282,033
Montana	17,108	1,795,850	-	15,273	43,988	6,842,309	-	24,816	118,896	14,938,998	-	81,680
Washington	33,288	4,780,400	-	37,397	61,150	8,206,754	-	24,419	134,411	26,619,442	-	114,923
Subtotal	640,810	130,305,490	-	714,363	456,979	77,291,335	-	257,685	1,696,532	318,799,014	-	1,478,636
Colorado	-	-	-	-	-	-	-	-	16,821	497,535	-	6,956
Wyoming	-	-	-	-	-	-	-	-	21,760	1,085,771	-	6,940
Subtotal	-	-	-	-	-	-	-	-	38,581	1,583,306	-	13,896
Total	640,810	130,305,490	-	714,363	456,979	77,291,335	-	257,685	1,735,113	320,382,320	-	1,492,532



TABLE 3
SUMMARY OF ALL OTHER CONTROL WORK FOR 1941

	Cultivated	i Black Cu	rrant Erad	ication		Nur	sery Sa	nitation	1		Preeradication Survey		
Stete	Number Inspections Made	Number Locatione Found	Number Bleck Currents Deetroyed			Number White Pines in Nurseriee		Dee	per Ribes etroyed Cultivated	Number 8-Hour Man-Deys	Number Acres Mepped White Pine and Protection Zones	Number 8-Hour Man-Days	
Idaho	-	-	-	-	-	-	-	-	-	-	49,000	350	
Montana	-	-	-	-	1	9,360,000	421	35,370	-	412		-	
Washington	-	-	-	-	-	-	_	-	-	-	-	-	
Subtotel	-	-	-	-	1	9,360,000	421	35,370	-	412	49,000	350	
Wyoming	-	-	-	-	-	-	-	-	-	-	5,800	22	
Total	-	-	_	-	1	9,360,000	421	35,370	-	-	54,800	372	

						Checking					
		Treetment	Infected	Trees		Adve	ence	Po	ost	Reg	ular
	Number	Number	Number	Number	Number		Number		Number		Number
	Treee	Treee	Treee	Cankers	8-Hour	Acreage	8-Hour	Acreage	8-Hour	Acreage	8-Hour
State	Examined	Treated	Removed	Removed	Man-Deye	Checked	Men-Daye	Checked	Man-Daye	Checked	Man-Daye
Idaho	1,093,920	937,478	30,122	-	2,591	-	-	-	-	-	-
Montana	61,360	57,718	3,446	-	942	-	-	-	-	-	-
Washington	344,676	343,767	2,369	-	778	-	-	-	-	-	-
Total	1,499,956	1,338,963	35,937	-	4,311	-	-	-	-	-	-

TABLE 3A SUMMARY OF ALL OTHER CONTROL WORK, 1918-1941 (INCLUSIVE)

	Cultivate	d Bleck Cur	rrant Erad:	icetion			1	Nursery Sa	nitation			
					Number of	Nuraeriee		Acres Wor		Number	r Ribea	
			Numoer					Nurseriee		Deat	royed	
	Number	Number	Black	Number	Senitation		Nurseriee	Which				Number
	Inepectione			8-Hour	Zone	Zone	Maintaining	i	l .			8-Hour
State	Mede	Found	Deetroyed	Man-Daya	Maintained	Abendoned	Zonee	Zonee	Acreage	Wild	Cultivated	Man-Daye
Idaho	5,233	2,471	16,553	2,341	-	-	-	-	-	-	-	-
Montana	1,311	798	5,080	514	1	-	8,778	-	8,778	1,372,351	-	7,165
Weehington	50,050	5,378	78,226	4,218	-	1	-	378	378	20,275	_	640
Subtotal	56,594	8,647	99,859	7,073	1	1	8,778	378	9,156	1,392,626	-	7,805
Wyoming	-	-	-	-	1	-	2,038	-	2,038	73,786	-	567
Total	56,594	8,647	99,859	7,073	2	1	10,816	378	11,194	1,466,412	-	8,372

	Preeradicetion S	urvev	Tr	eatment In	fected W	hite Pin	9
State	Number Acres Mapped White Pine and Protection Zones		Number Trees	Number Trees Treeted	Number Trees	Number Cankers Removed	Number 8-Hour
Idaho	3,318,860	4,475	1,134,116	961,397	38,606	-	2,845
Montana	259,675	798	69,826	65,868	3,762	-	1,137
Washington	146,541	342	344,676	343,767	2,369	-	778
Subtotel	3,725,076	5,615	1,548,618	1,371,032	44,737	-	4,760
Colorado	206,000	290	-	•	-	-	-
Wyoming	323,700	351	-	-	-	-	-
Subtotel	529,700	641	-	-	-	-	-
Totel	4,254,776	6,256	1,548,618	1,371,032	44,737	-	4,760



							Recapi	tuletion of	Federal Fun	ia		
							r Funda			Emerg	ency Funda	
					Surasu of En							
		Total		,	and Plant Qu	arantine	}					
	Federal	State (Inc.			Laudarahip							
	(All Agencies		iva Funda)		and	Lea		Dapartment		}		Total
	Including "State	Contributed		Grand	Coordination		Forset	of	rederal	Stata		Emergancy
State	W.P.A. Projects")	Service	Eradioation	Total	(3101)	(3103)	Sarvice	Interior*	W.P.A.	W.2.A.	c.c.c.	Funda
Ideho	\$556,019.97	\$1,000.00	\$23,299.13	\$580,319.10	\$62,313.11	\$6,810.78	\$375,898.82	_	€101,245.76	-	₹ 9,751.50	\$110,997,26
Montena	50,916.83	3,000.00	-	53,916.83	9,090.83	-	33,936.00	-	5,421.00	-	2,469.00	7,890.00
Weshington	74,148.19	1,000.00	-	75,148.19	7,722.72	-	35,179.18	\$8,780.63	21,859.66	-	606.00	22,465.66
Subtotal	681,084,99	5,000.00	23,299.13	709,384.12	79,126.66	6,810.78	445,014.00	8,780.63	128,526.42	-	12,826.50	141,352.92
Colorado	-	200.00	-	200.00	-	-	-	-	-	-	-	-
Wyoming	833,69	200.00	-	1,033.69	833.69	-	-	-	-	-	-	-
Subtotal	833.69	400.00	-	1,233.69	833.69	-	-	-	-	-	-	-
Total	\$681,918.68	\$5,400.00	\$23,299.13	\$710,617.81	279,360.35	\$6,810.78	\$445,014.00	\$8,780.63	\$128,526.42	-	\$12,826.50	\$141,752.92

<sup>\*</sup>Including National Parks, Indian Reservations and 0 & C.

		Rv		pitulation (Fedaral and	State)	
Stata	Sucervision Including State and District Leadars	Ribea	Nursery	Canker Elimination	Presredication	All Other (Checking, Field Data and Miscellaneous)
Idaho	\$32,563.35	\$481,828.16	-	\$20,019.66	\$2,800.00	\$43,107.93
Montana	8,247.77	33,611.00	\$3,296.00	1,413.00	-	7,349.06
Washington	4,665.66	50,424.56	-	5,310.51	-	14,747.46
Subtotal	45,476.78	565,863.72	3,296.00	26,743.17	2,800.00	65,204.45
Colorado	-	-	-	-	-	200.00
Wyoming	-	-	-	-	833.69	200.00
Subtotal	-	-	-	-	833.69	400.00
Total	\$45,476.78	\$565,863.72	\$3,296.00	\$26,743.17	\$3,633.69	\$65,604.45

TABLE 4A
SUMMARY OF ALL EXPENDITURES 1918-1941 (INCLUSIVE)

Stata	Federal (All Agencies Including State W.P.A. Projects)	Star (Including All Co- Contributed Service	operativa Funda)	Grand Total
Idaho	\$10,000,566.26	\$224,861.00	\$243,831.26	<b>2</b> 10,469,258.52
Montana	970,887.20	106,000.00	-	1,076,887.20
Washington	1,139,838.92	77,000.00	-	1,216,838.92
Subtotal	12,111,292.38	407,861.00	243,831.26	12,762,984.64
Colorado	79,290.00	11,700.00	-	90,990.00
Wyoming	76,705.65	4,700.00	-	81,405.65
Subtotal	155,995.65	16,400.00	-	172,395.65
Total	\$12,267,288,03	\$424,261.00	\$243,831.26	\$12,935,380.29

			Rac	apitulation of	redera			
		Regular				Emergency		
State	8.P.I. and 8.E.P.Q.	Forest Service	Dapartment of Intarior	Faderal, W.P.A.	State W.P.A.	c.c.c.	P.W.A.	Total Emergency Programa
Idaho	\$1,234,284.49	\$2,510,551.86	-	\$3,423,164.63	-	\$ 992,539.50	\$1,840,025.78	\$6,255,729.91
Montena	201,043.92	175,070.36	-	333,398.57	-	22,909.50	238,164.85	594,772.92
Washington	219,592.47	134,605.72	\$31,126.00	458,898.95		56,095.50	239,520.28	754,514.7
Subtotal	1,654,920.88	2,820,227.94	31,126.00	4,215,762.15	-	1,071,544.50	2,317,710.91	7,605,017.50
Colorado	11,852.04	-		59,396.51	-	-	8,041.45	67,437.96
Wyoming	11,314.28	-	-	58,283.96	-	-	7,107.41	65,391.37
Subtotal	23,166.32	-	-	117,680.17	-	-	15,148,86	132,829.33
Total	\$1,678,087,20	\$2.820.227.94	\$31,126.00	\$4,333,442.62	-	£1,071,544.50	\$2,332,859.77	\$7,737,846.89

				ecapitulatio	on l and State)		
Stata	Supervision (Including State and District Leadere)	Ribes Eradication	Cultiveted 81ack Current Eredication	Nursery	Canker Elimination	Presradication Survey	All Other (Checking, Field Data end Miscellansous)
Ideho	\$470,226.94	\$ 9,021,803.02	\$ 28,173.15	-	\$21,269.66	\$64,731.26	\$ 863,054.49
Montane	61,001.18	736,539.13	22,010.30	\$20,015.27	1,705.50	13,302.91	222,312.9]
Washington	46,793.79	717,744.75	63,838.81	2,273.74	5,310.51	5,077.77	375,799.55
Subtotel	578,021.91	10,476,086.90	114,022.26	22,289.01	28,285.67	63,111.94	1,461,166.95
Colorado	12,826.89	49,302.91	-	-	-	6,437.85	22,422.35
Wyoming	11,461.74	46,834.40	-	-	-	7,104.42	16,005.09
Subtotal	24,288.63	96,137.31	-	-	-	13,542.27	38,427.44
Total	\$602,310.54	\$10,572,224.21	\$114,022.26	\$22,289.01	\$28,285.67	\$96,654.21	\$1,499,594.39



TABLE 5

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP, 1941

Land Ownership	Initial Eradication  Number Number Acreage Ribes 8-Hour Worked Destroyed Man-Days		Acreage	eeradicatio Number Ribes Destroyed	Number 8-Hour	Totals Number Number Acreage Ribes 8-Hour Worked Lestroyed Man-Lays			
National Forests R-1	17,382	3,285,924	18,493	30,111	3,061,606	33,252	47,493	6,347,530	51,745
O and C Revested Lands	-	-	-	-	-	-	-	-	-
Other Public Domain	-	-	-	333	30,650	385	333	30,650	385
National Parks	60	3,016	51	1,419	69,311	1,583	1,479	72,327	1,634
Indian Reservations	-	-	-	-	-	_		-	-
Subtotal Federal	17,442	3,288,940	18,544	31,863	3,161,567	35,220	49,305	6,450,507	53,764
State and Private R-1	2,783	442,346	2,976	19,129	1,876,927	21,525	21,912	2,319,273	24,501
Grand Total	20,225	3,731,286	21,520	50,992	5,038,494	56,745	71,217	8,769,780	78,265

## NATIONAL PARKS

		Initial Wor	rk	Ree	radication	Work		Totals	
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Mount Rainier	-	-	-	1,419	69,311	1,583	1,419	69,311	1,583
Glacier	60	3,016	51	-	-	-	60	3,016	51
Total	60	3,016	51	1,419	69,311	1,583	1,479	72,327	1,634
	STATE AND PRIVATE LANDS								
Idaho	1,654	359,946	2,311	17,811	1,677,012	20,122	19,465	2,036,958	22,433
Montana	1,129	82,400	665	193	24,260	271	1,322	106,660	936
Washington	_	_	-	1,125	175,655	1,132	1,125	175,655	1,132
Total	2,783	442,346	2,976	19,129	1,876,927	21,525	21,912	2,319,273	24,501
			N.	ATIONAL 1	FORESTS				
Clearwater	92	-	-	4,132	-	-	4,224	-	-
St. Joe	4,458	-	_	11,601	-	-	16,059	-	-
Coeur d'Alene	3,087	-	-	4,226	_	-	7,313	-	-
Kaniksu	6,355	-	-	7,958	-	-	14,313	-	
Cabinet	3,390	-	-	2,194	-	-	5,584	-	-
Total	17,382	3,285,924	18,493	30,111	3,061,606	33,252	47,493	6,347,530	51,745



# SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS 1918-1941 (INCLUSIVE)

		Control A	rans	Iniz	ial Eradicatio	on.
Land Ownership a	Total Acreage of White Pina Worth Protection b		Acraage Not Yet Workad		Number Ribes Destroyed f	Number
National Forasta R-1	1,392,925	1,322,765	288,617	1,034,148	214,713,832	923,706
National Foresta R-2 and 4	421,000**	421,000**	384,381**	36,619	1,496,420	13,232
Subtotal	1,813,925	1,743,765	672,998	1,070,767	216,210,252	936,938
Other Public Domain	31,905	30,865	14,068	16,797	2,807,572	10,896
National Parks	110,054**	43,954**	33,067**	10,887	1,964,348	12,903
Indian Reservations (Shoshona)	11,000**	11,000**	11,000**	-		-
Subtotal Fedaral	1,966,884	1,829,584	731,133	1,098,451	220,982,172	960,737
Stata and Privata	1,244,660	1,114,128	292,433	821,695	144,066,594	554,883
Grand Total	3,211,544	2,943,712	1,023,566	1,920,146	365,048,766	1,515,620

<sup>\*</sup>Column d \* column e equals column c. Tha total of column a of this table should agree with the total of column f of Table 1A.
\*\*Indefinite

	Rearadication Work			Totals (Initial and Rework)			
Land Ownership	Acreage Worked	Number Ribas Dastroyed	Numbar 8-Hour Man-Deys	Acreaga Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	
National Forasts R-1	220,805	29,016,467	251,551	1,254,953	243,730,299	1,175,257	
National Forests R-2 and 4	1,962	86,886	664	38,581	1,583,306	13,896	
Subtotal	222,767	29,103,353	252,215	1,293,534	245,313,605	1,189,153	
Other Public Domain	5,527	791,033	6,212	22,324	3,598,605	17,108	
National Parks	6,768	481,347	7,679	17,655	2,445,695	20,582	
Indian Reservations	-	•	-	-	-	-	
Subtotal Federal	235,062	30,375,733	266,106	1,333,513	251,357,905	1,226,843	
State and Privata	174,501	30,190,500	175,634	996,196	174,257,094	730,517	
Grand Total	409,563	60,566,233	441,740	2,329,709	425,614,999	1,957,360	

#### SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS 1918-1941 (INCLUSIVE)

		Control Areas		Initial Eradication		
National Perks a	Total Acreage of White Pine b	Total Acreage* (Whita Pine and Protective Zones) c	Acraaga Not Yet Worked Initially d	Acreage Worked e	Numbar Ribea Deatroyed f	Number 8-Hour Man-Days g
Mount Rainiar	8,254	8,254	-	8,254	1,640,507	10,070
Glacier	20,000	10,000	7,367	2,633	323,841	2,833
Yallowstone	69,000	12,900	12,900	-	-	-
Grand Teton	5,800	5,800	5,800	-	-	-
Rocky Mountain	7,000	7,000	7,000	-	-	-
Total National Parks	110,054	43,954	33,067	10,887	1,964,348	12,903

<sup>\*</sup>Column d + column e = column c.

	Ra	eradication We				ork)
National Parks	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days		Number Ribes Destroyad	Number 8-Hour Man-Days
Mount Rainier	6,768	481,347	7,679	15,022	2,121,854	17,749
Glacier	-	-	-	2,633	323,841	2,833
Total National Parks	6,768	481,347	7,679	17,655	2,445,695	20,582



#### SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANLS 1918-1941 (INCLUSIVE)

		Control A	Initial Eradication			
State and Private Lenda	Total Acreage of White Pine	Totel Acresge* (White Pine and Protective Zones) c	Acreage Not Yet Worked Initially d	Acreage Worked	Number Ribes Destroyed f	Number 8-Hour Man-Days
Idaho	1,145,975	1,017,933	264,579	753,354	125,838,742	489,088
Montsna	37,215	34,725	12,894	21,831	2,773,348	14,83
Weshington	61,470	61,470	14,960	46,510	15,454,504	50,960
Total	1,244,660	1,114,128	292,433	821,695	144,066,594	554,88

\*Column c = column d and column e.

	Rei	eradicetion W	ork	(In:	Totals	ork)
State and Private Lenda	Acreage Worked	Number Ribss Destroyed		Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Lays
Ideho	155,065	26,094,546	153,655	908,419	151,933,288	642,743
Montana	3,227	441,189	4,112	25,058	3,214,537	18,947
Washiogton	16,209	3,654,765	17,867	62,719	19,109,269	68,825
Total	174,501	30,190,500	175,634	996,196	174,257,094	730,51

SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS 1918-1941 (INCLUSIVE)

		Control A	reaa	Initinl Eradication			
National Forests	Total Acreage of White Pine b	Total Acreage (White Pine end Protective Zones)*	Acreege Not Yet Worked Initially d	Acreage Worked	Number Ribes Destroyed i	Number 8-Hour Man-Days g	
Cleurwater	204,730	195,870	47,684	148,186	~	-	
St. Joe	312,080	300,991	84,833	216,158	-	-	
Coeur d'Alene**	358,395	348,092	34,716	313,376	-	-	
Kaniksu	354,195	327,993	74,961	253,032	-	-	
Cabinet	76,630	74,318	17,703	56,615	-	-	
Kootsnai	86,895	75,501	28,720	46,781	-	-	
Subtotal Region One	1,392,925	1,322,765	288,617	1,034,148	214,713,832	923,706	
Region Two	394,000	394,000	357,381	36,619	1,496,420	13,232	
Region Four	27,000	27,000	27,000	-	-	-	
Total	1,813,925	1,743,765	672,998	1,070,767	216,210,252	936,938	

<sup>\*</sup>Column c = column d and column e. \*\*Includes Forest Service land in Mount Spokene unit.

	Re	radication W						
National Forests	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Daya	Acresga Worked	Number Ribes Destroyed	Number 8-Hour Man-Daya		
Clearwater	51,105	-	-	199,291	-	-		
St. Joe	72,394	-	-	288,552	-	-		
Coeur d'Alene	52,085	-	-	365,461	_	-		
Keniksu	37,948	-	-	290,980	-	-		
Cabinet	6,108	-	-	62,723	-	-		
Kootenai	1,165	-	-	47,946	-	-		
Subtotal Region One	220,805	29,016,467	251,551	1,254,953	243,730,299	1,175,257		
Region Two	1,962	86,886	664	38,581	1,583,306	13,896		
Region Four	-	-	-	-	-	-		
Total	222,767	29,103,353	252,215	1,293,534	245,313,605	1,189,153		

STATUS OF BLISTER RUST CONTROL 1918-1941 (INCLUSIVE)

State	Control Area Including Border Zones (Acrea)	Net Control Area Initially Protected (Acrea)	Control Areas Rsworked Subsequent to Ioltial Protection (Acrea)	Number 8-Hour Men-Days (Meo-Daya)	Ribes Destroyed (Wild and Cultivated) (Number)	Remaining Control Area Needing Initial Protection (Acres)	Estimated Protected Area Now on Maintenance Basia* (Acres)
Ideho	2,122,119	1,632,535	360,481	1,705,686	372,682,032	489,584	657,427
Montenn	194,544	127,860	10,500	101,768	17,773,689	66,684	67,208
Weshington	169,349	123,132	36,620	136,010	33,575,972	46,217	47,205
Subtotal	2,486,012	1,883,527	407,601	1,943,464	424,031,693	602,485	771,840
Colorado	206,000**	14,859	1,962	6,956	497,535	191,141	8,000
Wyoming	251,700**	21,760	-	6,940	1,085,771	229,940	9,000
Subtotal	457,700	36,619	1,962	13,896	1,583,306	421,081	17,000
Total	2,943,712	1,920,146	409,563	1,957,360	425,614,999	1,023,566	788,840

\*Meintenance - Any portion of a control arsa that has through ertificial (eradication of ribes) or natural trastment (shading out of ribes) acquired e atatua wherein the accordity of ribes assures affective blister rust control for an indeficite period, such that no further work (except perhaps accouling) is expected to be needed during the current forest cycle. This status continues for a verying number of years until, after a major ecological change, a renewed increase and growth of ribes again endangers the cine, end these arees then revert to a rowork etatus.

\*\*Indefinite

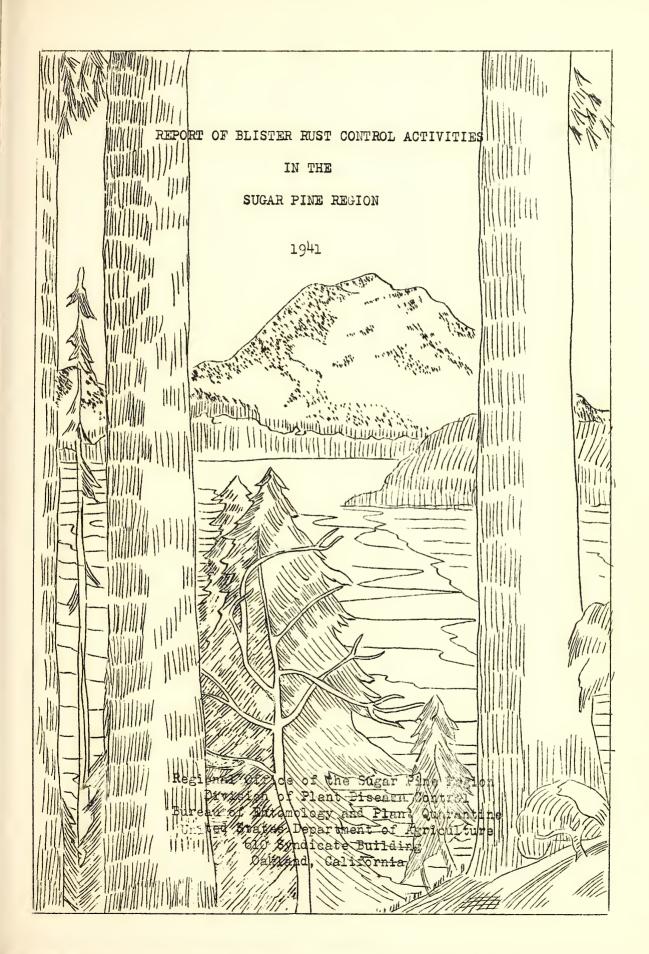


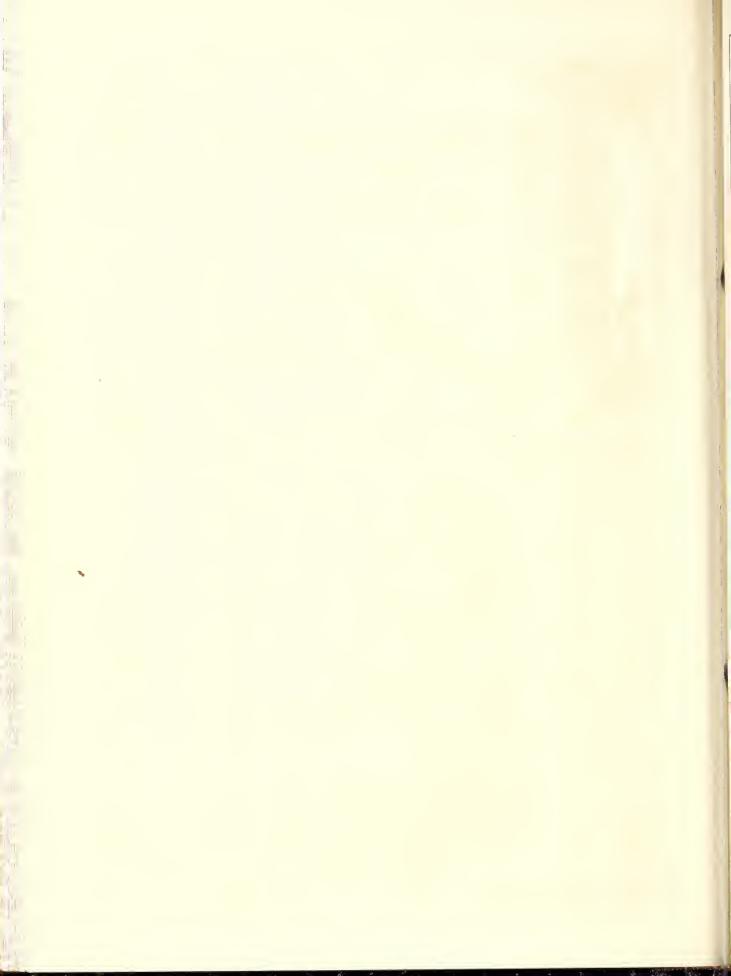


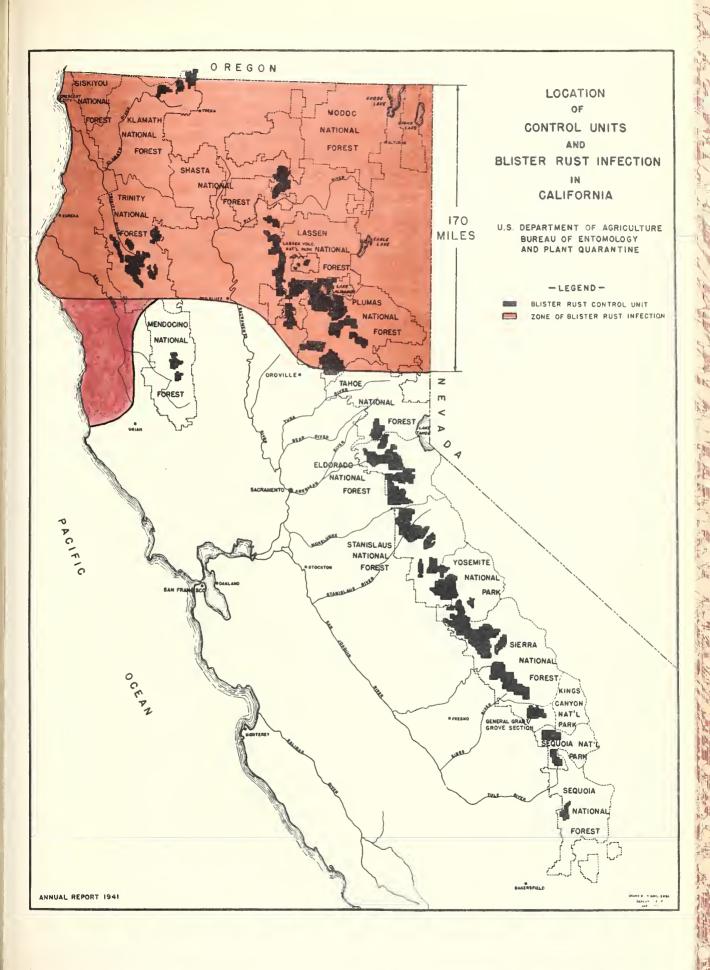












## TABLE OF CONTENTS

		Page
PART	I - GENERAL	
	Text  Financial Tables: Fiscal Year Allotments from Which Expenditures	1 5
	Were Made During Calendar Year 1941, Sugar Pine Region	6
	Expenditures for Calendar Year 1941	7 <b>-</b> 8
	Classified Bureau Expenditures by Appropriations and Projects, Sugar Pine Region (Jan. 1, 1941 to Dec. 31, 1941)	9
	Omnibus Tables	10-17
PART	II - EDUCATIONAL	
	Text	18-21
PART	III - RIBES ERADICATION	
	Text Tables:	22-27
	The Status of Ribes Eradication by Land Ownership in the Sugar Pine Region as of Dec. 31, 1941	28 <b>-</b> 29
	Summary of All Ribes Eradication in the Sugar Pine Region, 1941	30
	Summary of Ribes Eradication by Operations for California -	
	Initial Work	31 32 33
	Summary of Ribes Eradication for Oregon	34
	The Distribution of Camps by Operation and County in the Sugar Pine Region during 1941	35
	Adjusted Statement of Cost of Ribes Eradication for the Sugar Pine Region, 1941	36

		Page
PART	III - RIBES ERADICATION (Continued)	
	Maps Showing Progress of Blister Rust Control -	
	California - Klamath National Forest Plumas " " Eldorado " " Stanislaus " " Sierra " " Yosemite National Park	37 38 39 40 41 42
	Oregon - Siskiyou National Forest	43
PART	IV - CHECKING	
	Text Tables:	44-49
	Summary of Regular Checking in the Sugar Pine Region, 1941	50
	Summary of Advance and Post Checking in the Sugar Pine Region, 1941	51
	Analysis of Checking Cost and Production in the Sugar Pine Region - 1941	52-54
	Analysis of All Regular Checking in the Sugar Pine Region - 1941	55
PART	V - SCOUTING	
	Text Tables:	56-69
	Record of Blister Rust Infections Found in Oregon During 1941	70-74
	Record of Blister Rust Infections Found in California During 1941	75-80
PART	VI - RECONNAISSANCE	
	Text	81-83
	Location of Area Covered by Reconnaissance on the Trinity National Forest, California. 1941	83
	Summary of Reconnaissance Data from the Trinity National Forest, California, 1941	83

		Page
PART	VII - METHODS STUDIES	
	Section 1 - Ribes Ecology	84-110
	<ol> <li>Cow Creek 10-Acre Regoneration Plot</li> <li>Occurrence of Current Season Seedlings on</li> </ol>	
	Eradicated Areas  3. Seedling Survival and Growth  4. Regeneration of Ribes on Burns  5. One-Acre Regeneration Plots  6. Grazing Exclosures and Comparison Plots	86- 87 87- 89
	(Controls)	
	Tables 1 - 14 inclusive	91-106
	8. Cross- and Self-Pollination of Ribes	
	Figure 1 - Regeneration Key	110
	Section 2 - Methods Development Work	111-125
	Results of 1940 Work	
	Regular Stringing vs. Pre-stringing Use of Dynamite on large <u>Ribes</u> nevadense Use of Oil on Rockbound Ribes	111 112 112
	Further Comments on Work Done Prior to 1940	
	Paired Bush <u>Ribes cercum</u> Dynamite Plots (1939) Eradication of Upland Ribes by Power	
	Methods (1939)	
	Beasore Meadow, Sierra National Forest Results of Dosage Tests on Diesel Oil and New Oil Mixtures on Small Ribes roezli Plants and the Effect of Oil on the Via- bility of Ribes Seeds and Seedling	
	Establishment	112
	Ribes roezli	113
	Tables 1 - 3 inclusive	114-116
	Progress of Ribes Eradication by Power  Methods "Up and Over" Peavey-Handled Tool  Hydraulic Jack and Tongs  Claw Mattocks	117 117 117 117
	Plates 1, 2, 3, (Photographs)	118-120

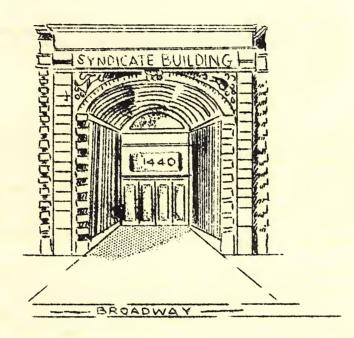
105	_
PART VII - METHODS STUDIES	
Section 2 - Methods Development Work (Continued)	
Oil Tests on Ribes roczli, Plumas National Forest	
Laboratory and Greenhouse Work During 1941122-12	23
Status of Recommendations on Special Methods of Ribes Eradication and Summary Report on New Developments of 1941 -	
Recommendations	24

BLISTER RUST CONTROL IN THE SUGAR PINE REGION 1941

PART I - GENERAL

Ву

Warren V. Benedict, Senior Forester



## INTRODUCTION

Blister rust control work in the Sugar Pine Region, comprising the states of Oregon and California, was continued during 1941 as a cooperative undertaking in accord with existing agreements between the Eureau of Entomology and Plant Quarantine and each State, and between the Eureau and Regions 5 and 6 of the Forest Service, Region 4 of the National Park Service, and with the Oregon and California Revested Lands Administration. Control work was undertaken on seven national forests, one national park, and on interspersed State and private and Oregon and California revested lands. The work of the Eureau of Entomology and Plant Quarantine was performed on lands predominantly in State and private ownership and the work of other Federal agencies on predominantly Federally-owned lands under their jurisdiction. The position of the Eureau as technical leader, advisor, and coordinator of all control work in the Sugar Pine Region was continued as heretofore.

The regular program of control was continued in 1941, but on a much curtailed basis. For the region as a whole, about 1,030 men were employed on control work, whereas over 3,000 men were employed the year previous.

Work in all units was a continuation of the work which had been previously under way on those units. Accomplishments for 1941 were divided on the basis of 28,384 acres of initial work on new areas and 35,592 acres of reeradication on areas treated previously, but on which Ribes regeneration had reached a point where follow-up eradication was needed.

The accomplishments of this year, added to the work of previous years, show the status of control in the Sugar Pine Region to stand as follows:

Control areas		
Initial Ribes eradication completed on	856,482	tt
Ribes reeradication completed on	331.827	11
Complete control established on		11
Average per acre east of eradication		
to date	\$3.22	

Of particular significance to the control program of the Region in 1941 was the beginning of Ribes eradication work on private lands on a cooperative basis under the provisions of the Lea Act (Public 486, 76th Congress, approved April 26, 1940). This act provides in the discretion of the Secretary of Agriculture for the use of Federal funds for the control of white pine blister rust on State and private lands in amounts equivalent to those contributed for the same purpose by the several states, by private timber-land owners, and by other public and private agencies.

About the middle of June, the Sugar Pine Region received \$5,300 of regular funds through the release of budget reserves of Fiscal Year 1941. These funds were used to initiate control work on lands of predominantly private ownership under the cooperative program outlined by the Lea Act. A Ribes eradication camp was thus immediately established at Hayward Creek on the Stanislaus National Forest.

In July the Bureau received a specific appropriation under authority of the Lea Act for work on State and private lands, of which \$14,625 was allotted to the Sugar Pine Region. This fund not only permitted the continuance after June 30 of the Hayward Creek camp, but also the conversion of a camp on Beaver Creek, also on the Stanislaus National Forest, from ERA work to regular cooperative work on State and private lands. The two camps operated until about August 20, when the exhaustion of the allotment forced them to close.

The State of California evinced its interest in the white pine resources of the State and its desire to participate in the control program of the Federal Government by passing in July Senate Bill No. 223, entitled "An act appropriating \$50,000 to the Division of Forestry, Department of Natural Resources, for forest protection against the white pine blister rust". Because these funds could not be obligated until ninety days after passage of the bill, use of the money had to be delayed until the spring of 1942, owing to the termination of the field season before the ninety days had elapsed. About \$18,000 of this amount will be expended in the fiscal year of 1942.

The State of Oregon passed in June an act "authorizing the State Board of Forestry to accept funds and to expend funds in cooperation with agencies of the United States in protecting forest lands within the State from white pine blister rust and appropriating money therefore." Although the act authorizes the expenditure of \$10,000 from funds already appropriated, it is primarily an enabling act and carries no actual appropriation with it. Since there was no money at the disposal of the State Board of Forestry that could be spared from other uses, none was available under the act for the prosecution of control work in 1941.

For the first time regular appropriations for control work were made to two agencies of the U. S. Department of the Interior operating in the Sugar Pine Region. The National Park Service was allotted funds for eradication work on lands of Yosemite National Park, and the Oregon and California Revested Lands Administration for its lands in southern Oregon. Work accomplished with these allotments is described in Part III of this report.

After a fairly slow but steady decline since 1937, there was experienced this year a sharp reduction in the results obtained with programs financed by emergency relief funds. This was due primarily to a shortage of clients eligible to participate in the relief programs rather than to a shortage of such funds made available to the Blister Rust Control programs in this Region. Although the number of CCC camps assigned to BRC work was reduced from previous seasons, those remaining were at all times undermanned, sometimes to the point of being entirely ineffective. The situation was similar in BRC work financed by allotments from the Emergency Relief Appropriation Acts. Although ample funds were or could have been made available for a program comparable in size to the previous year, WPA labor was simply not available. Private industry and military projects absorbed practically all WPA labor of the type formerly available for the BRC projects. For this reason a considerable amount of such funds actually allocated for BRC work in this Region had to be refused or turned back as unexpended.

During May and June a Bureau Federal agency project consisting of three ERA camps totaling not more than 200 men at any time operated in California, and a project consisting of one camp of not more than 50 men in Oregon. In spite of allocations of Federal Agency ERA funds to continue and augment these projects in both states, it was necessary to discontinue the projects and close the camps because of the failure of the State WPA Administrators to approve project applications for the fiscal year of 1942. Early in September, however, a small Ribes eradication ERA project was approved for southern Oregon, and a crew of about fifteen men was employed on the Pinehurst Unit until near the end of October. In California an average crew of 20 men was employed from September until the end of the year under a project approved for the dismantling of the former ERA camps and the transportation and reconditioning of equipment used in connection with them. The close of the Bureau ERA projects on December 31, 1941 marked the first time since July, 1935 that the Sugar Pine Region had no operating BRC projects financed by allotments of funds from the Emergency Relief Appropriation Acts. As long as the war emergency exists it is expected that no WPA projects will be approved for operation in this region.

Scouting for blister rust in 1941 yielded significant extensions of the range of the disease and information on its ability to intensify on sugar pine under favorable conditions. In Oregon new infections were found on the Umpqua, Rogue River, Siskiyou, and Klamath Mational Forests, pointing to the conclusion that blister rust is established in the southern part of the State wherever conditions are favorable for its growth. Blister rust was discovered in 1941 on both pines and Ribes in Crater Lake Mational Park.

As a result of favorable weather and the sporulating of cankers that originated in 1937, the disease spread generally over the Klamath National Forest on the northern border of California, and developed a particularly intense and widespread infection on Ribes in the control unit near Hilt. In this unit numerous sugar pines also are diseased. At the southern end of the Plumas National Forest, 23 infected sugar pines were found having 74 cankers. This discovery extended the southernmost known limit of blister rust in the Sierra Nevada six miles, and of infection on sugar pines sixty miles. Blister rust on Ribes menziesii was discovered in the Coast Range at several places as far as 200 miles south of the Oregon line. Infected sugar pines were found at almost every point reexamined where infected Ribes had been found in 1938. It is thus apparent that blister rust is steadily and irrevocably moving southward into the rich pine-growing lands of California.

The organization and assignment of personnel of the Sugar Pine Region remained essentially the same as in previous years. As no relisting of the personnel will be given here, the annual report for 1940 may be consulted for information on these points.

Tables 1, 2, and 3 provide financial information presented for ready comparison in forms similar to that of previous annual reports.

Table 1 shows the allotments of Regular Funds and Emergency Relief Funds to each of the cooperating Federal Agencies of the Sugar Pine Region for the Fiscal Year 1941 and 1942 from which expenditures of the calendar year 1941 were made. Differences that may be noted in the amounts reported this year as Fiscal Year 1941 allotments from the amounts reported last year are due to increases or decreases made after the end of the calendar year 1940. The amounts shown in this roport as allotments for the fiscal year 1941 are no longer subject to change and therefore may be considered as final. The amounts shown as allotments for the fiscal year 1942 are subject to changes that may be made between January 1 and June 30, 1942.

Table 2 shows the expenditures that each of the cooperating Federal Agencies made during the calendar year 1941, and from which program and Fiscal Year Allotments the funds were derived.

CCC expenditures are not included in these tables because such funds are not allocated directly for Blister Rust Control work. The cost of work accomplished by the CCC program is arrived at in the Sugar Pine Region by arbitrarily fixing \$1.50 per effective man day as a cost for enrollee labor and adding such other specific costs as may be paid from CCC funds by the sponsoring work agency. These costs are included in Table 4 of the Omnibus Tables on page 13.

Table 3 classifies Bureau expenditures by appropriations and field projects for the calendar year 1941.

Although not revealed by the tables the Bureau disbursed regular funds in the amount of \$16,833.41 in addition to the totals shown as having been expended by the Bureau. This amount however is accounted for as having been expended by our Federal Agency cooperators since, in accordance with cooperative work plan agreements they reimbursed the Bureau for an agreed portion of the cost of checking and supervision furnished by the Bureau to the programs conducted on lands of their jurisdiction. Forest Service, Region 5, reimbursed the Bureau in the amount of \$11,448.33; Yosemite National Park in the amount of \$3,216.44; and Oregon and California Revested Lands Administration in the amount of \$2,168.64. This arrangement contributed materially to the effectiveness of the checking work.

The Omnibus Tables, which are special summaries of control activities in the Region prepared for the Washington Office, have been revised as of December 31, 1941 and are given on the following pages 10 to 17 inclusive.

Detailed reports on the progress of Ribes eradication are presented under the following headings:

Part II - Educational By John C. Crowell, Agent

Part III - Eradication: By Roy Blomstrom and Conrad P. Wessela,
Associate Foresters

Part IV - Checking: By Lyle N. Anderson and S. Daryl Adams, Agents

Part V - Scouting: By Douglas R. Miller, Associate Forester

Part VI - Reconnaissance: By Douglas R. Miller, Associate Forester

Part VII - Methods Studies: By Harold R. Offord, Pathologist,
Clarence R. Quick, Associate Forest
Ecologist, and
Lawrence P. Winslow, Agent

FISCAL YEAR ALLOTMENTS FROM WHICH EXPENDITURES WERE MADE
DURING CALENDAR YEAR 1941 - SUGAR PINE REGION

Bureau of Entomology and Plant Quarantine:	Fiscal Year 1941	Fiscal Year 1942
Regular Funds ERA Administrative ERA Field Project Total	6,556	\$ 77,609 3,300 31,330** \$112,239
* California \$184,450 plus Oregon \$37,800 **California \$9,330 plus Oregon \$22,000 (avail	able to Dec. 31,	1941 only)
U. S. Forest Service, Region 5 - California:  Regular Funds  ERA Field Project		\$181,000 _
U. S. Forest Service, Region 6 - Oregon:  Regular Funds	··· -	\$ 4,000
National Park Service:  Regular Funds - Yosemite National Park		\$ 58,815 6,100 \$ 64,915
Oregon and California Revested Lands Administr	cation:	
Regular Funds	-	\$ 30,000

## TABLE 2

## EXPENDITURES FOR CALENDAR YEAR 1941

		California	Oregon	Total
Bureau of Ento	mology and Plant Quar	antine:		
1. Regular	Funds:			
Fi scal Fi scal	Year 1941 Year 1942 Total	\$ 33,062.36 36,935.38 \$ 69,997.74	\$ 3,995.00 3.365.37 \$ 7,360.37	\$ 37,057.36 40,300.75 \$ 77,358.11
2. ERA Adm	inistrative Funds:			
Fiscal Fiscal	Year 1941 Year 1942 Total	\$ 3,128.56 3,290.78 \$ 6,419.34	-	\$ 3,128.56 3,290.78 \$ 6,419.34
3. ERA Pro	ject Funds:			
Fi scal Fi scal	Year 1941 Year 1942 Total	\$ 46,764.16 6,651.60 \$ 53,415.76	\$ 5.626.94 1.507.90 \$ 7.134.84	\$ 52,391.10 8,159.50 \$ 60,550.60
4. All Fun	ds:			
Fiscal Fiscal	Year 1941 Year 1942 Total	\$ 82,955.08 46,877.76 \$129,832.84	\$ 9.621.94 4.873.27 \$14.495.21	\$ 92.577.02 51,751.03 \$144,328.05
U. S. Forest S	ervice - Region 5, Ca	lifornia:		
l. Regular				
Fi scal Fi scal	Year 1941 Year 1942 Total		· · · · · · · · · · · · · · · · · · ·	\$ 53.758 112,247 \$166,005
2. ERA Pr	oject Funds:			
Fiscal	Year 1941 Only		• • • • • • • • • • • • • • • • • • • •	\$ 2,377
3. All Fun	ds:			
Fi scal Fi scal	Year 1941 Year 1942 Total			\$ 56,135 112,247 \$168,382

THE PARTY OF THE P

## TABLE 2 (CONTINUED)

## EXPENDITURES FOR CALFNDAR YEAR 1941

	California	Oregon	Total
National Park Service - California	<u>.</u> :		
Regular Funds - From Fiscal Yea	ır 1942 Allotmen	nts only	
Yosemite National Park Regional Office Total			
U. S. Forest Service - Region 6, C	regon:		
From Fiscal Year 1942 Allo	tments only	\$	2,081
O and C Revested Lands Administrat	ion - Oregon:		
Regular Funds:			
From Fiscal Year 1942 Allo	tments only	\$	17,792

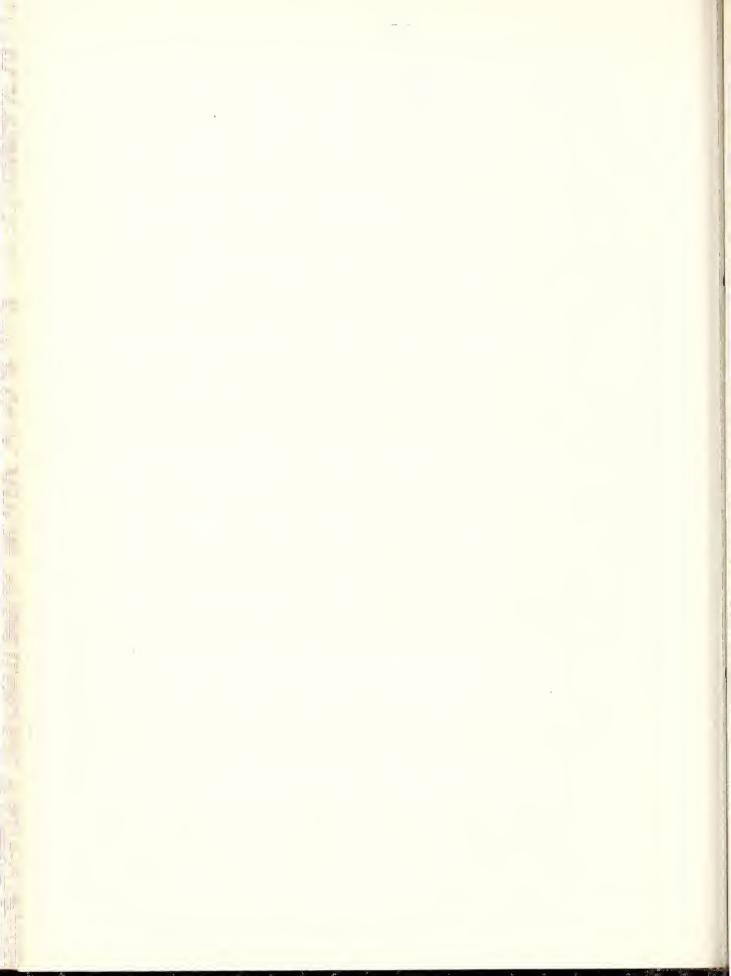
## TABLE 3

# CLASSIKIED BURRAU EXPERIDITURES BY APPROPRIATIONS AND PROTECTS - SUGAR PIRE REGION

January 1 to December 31, 1941

The control of the	Anvror and Symbol  ENA-Encilar  ENA-Administrati  ENA-Encilar  ENA-Encilar  ENA-Encilar  Total  ENA-Encilar  Total  ENA-Encilar  Total  ENA-Encilar  Total  ENA-Administrati  ENA-Encilar  Total	bea	ornia							
State   Activation   Activati	Anvror and Symbol Symbol EXA-Exergency EXA-Exergency EXA-Administrati EXA-Administrati EXA-Exergency EX-Exergency EXA-Exergency EX-Exergency	3		Oscarbon A				02020		
State   Stat	Symbol  Eld-Endlor  Eld-Endlor  Eld-Endlor  Eld-Endlor  Eld-Endlor  Eld-Energency		מיסור זיייים	overneed	Methods			Overhead and		Sugar Pine
State   Stat	E34-E671101   E34-E671101	Eldorado Operation	Stanislens Operation	General Expenses	Unit Berkeley*	To tal	Ribes Eradication	General Expenses	Total	Region Grand Total
Ex-Emery   MONOP-65/299   1691-16   1691-16   1591-16	ENA-Energency    ENA-Administrati   ENA-Administrati   ENA-Administrati   ENA-Administrati   ENA-Energency   E	290		\$19.748.06		\$ 19.748.06		\$3.049.92		
The color of the	Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal     Dotal	99		1,621,42		1,624.42		010(1545	010(130	1,624,42
Part	Total     ERA-Emergency   ERA-Administrati     ERA-Administrati     ERA-Administrati     ERA-Administrati     ERA-Administrati     ERA-Administrati     ERA-Emergency     ERA-Emerge	99		519.06		619.06				519.06
Part	Dotal	99		3.279.96		3.279.96				3,099,98 7,270,96
The control of the	ERA-Enlar   ERA-ENLAR   ERA-	3.		46,696,06		46,696,06		5.295.62	5,295,62	51.001.68
The color of the		·s>	\$ 1,971.96	635.40		2,833,21	ঞ	154.00	657.35	8
The Partnerse   The Partners	ERA-Administrati  Total  Total  Total  Total  Total ERA-Administrati  ERA-Administrati  ERA-Administrati  ERA-Administrati  ERA-Emergency  ERA-Emergency  ERA-Emergency  ERA-Emergency  ERA-Emergency  Total  Total  Total  EQ-:Egular  Total		8,591.77	1,397.30	li	10,866,57	17.724		167.77	11,364,34
The color   The	Total     Total     ERA-Administration     ERA-Emergency	7	5,087,98	11,741.34		25,059,01	2,471,94		2,471,94	27,530,95
The color of the	Total     Eld-Emergency     Eld-Emerge	99		5,064,23	286.20	5,350.43	1,192.08		1,192,08	6.542.51
The second color of the color	Total     ENA-Emercency     ENA-	000								
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The first color of	mi - ERA-Emergency e ERA-Adrinistrati Total	L		3.295.64		7,205,64		200	The Cart	2 205 61
The Pherence   Colored	mider ERA-Emergency Total	31								The Const
The color   The		66		5,135,05		5.135.05		1,563,77	1,563,77	6,698,82
The Administrative Monoge-652999   September   Septe	ENA-Administrative   ENA-Administrative   ENA-EMERGENCY   EN	66								
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The color of the	Total	99							1	
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ERR-Emergency   401005-65299   3,939.89   3,171.25   290.93   1,020.77   1,020.77   1,120.55   1,120.85   1,	ERA-Emergency		590.05	505,36		1,426,13	63-99		63,09	1,490,12
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Bill	d nses Tota		190,81	3.784.66		1,027,47	1.25	77.77	7.02	4, 028, 49
ERA-Emergency   101087-651999   145.87   145.00   1.71   1.71   1.75   156.61   1.72   1.75	Ses Tota		11.35	3.17h.80		3.186.15		252,47	2E2_L7	
Big	Ses		560,62	4,700,01	1.71	5.656.61	29.00	740.07	329.69	6.486.30
RRA-Administrative \$0,0005-65,999	Tota			343,00		740.77	36.33		36.33	427.10
Total	Total	66								
Total   189.14   762.78   12,013.37   1.71   13,267.00   137.20   986.71   1,123.51     DQ-Pegular 1222245(13).031   205.89   2,525.04   2,525.04   2,525.05   35.25.5   35.25.5   35.25.5   35.25.5     ERA-Administrative holoog-65299   660.30   752.63   4,922.26   10.78   5.345.97   279.49   279.49   279.49     ERA-Administrative holoog-65299   741.13   2,900.44   29,422.26   10.78   6,345.27   794.40   3,250.22   3,562.40     ERA-Administrative holoog-65299   741.13   2,900.44   29,422.26   10.78   6,345.27   794.40   3,267.65   3,956.00     ERA-Administrative holoog-65299   1,113.92   10,399.71   2,400.79   3,405.75   3,562.40   6,574.50   3,662.40   1,507.90     ERA-Administrative holoog-65299   1,113.92   10,399.71   2,400.79   3,406.20   3,606.40   3,606.40     ERA-Administrative holoog-65299   1,400.70   4,922.26   1,400.70   3,406.70   1,507.90     ERA-Administrative holoog-65299   1,400.70   3,400.70   3,400.70   3,400.70   3,400.70   1,507.90     ERA-Administrative holoog-65299   1,400.70   1,507.90   1,507.90   1,507.90     ERA-Administrative holoog-65299   1,400.70   1,507.80   1,507.90   1,507.90   1,507.90     ERA-Administrative holoog-65299   1,400.70   1,507.80   1,507.90   1,507.90   1,507.90     ERA-Administrative holoog-65299   1,400.70   1,507.80   1,507.90   1,	Total			10.00		10.00				10,00
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Name	= [		147.62	1,451,67		1,735,85	128,75	26.63	218.72	1,954,57
Total			205-89	2,525.07		2,730,96	353.55		353,55	3.084.51
State Administrative blook-651999   E94.34   E91.34   E79.49   E	Tru-puergency		599.12	025.50	10.78	1,587,00	32.61	256.38	228,99	1,875,99
ENA-Administrative 401002-551999  tal		139		291.74		291,34	279.49		279.49	570.83
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Oalland office processed vouchers in the amount of \$13,757.80 of Regular Funds allotted directly to the Methods Unit for work in both the Sugar Fine and Northwestern Regional Blister Rust Control Office.



## Omnibus Tables

SUMMARY OF 1941 RIBES ERADICATION

	Init	ial Eradicatio	on Work	Re	eradication We	ork		Percent Initial		
State	Acreage Worked	Number of Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number of Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number of Wild Ribes Destroyed.	Number 8-Hour Man Days	Eradica- tion Worked
California	22,701	3,336,437	21,265	34,978	3,450,150	16,071	57,679	6,816,917	37,336	1.13
Oregon	5,683	167,093	1,900	614	74,066	368	6,297	241,159	2,268	1.08
Total	28,384	3,503,530	23,165	35,592	3,554,546	16,439	63,976	7,058,076	39,604	1.12

	Ribes Pe	r Acre	Man Days	Per Acre		Numbe	r of Cam	o e			Number	of Emplo	oyees	
State	Initial Eradication	Re- eradication	Initial Eradication	Re- eradication	ccc & scs	WPA	Regular	Total	CCC &		Regular	Total	All Super- vieion	Employeee
California	147	100	0°ð†	0.46	6	3	12	21	320	213	541	1,074	73	1,147
Oregon	29	121	0.33	0.60	-	2	2	4		45	50	95	14	109
Total	123	100	0.82	0.46	6	5	14	25	320	258	591	1,169	87	1,256

TABLE 1A
SUMMARY OF ALL RIBES ERADICATION 1918-1941 INCLUSIVE

THE RESERVE OF THE PROPERTY OF

State	Total Acreage White Pine	Acreage White Pine Worth Protection	Acreage Control Areae (White Pine and Protective Zones)	Acreage Reported Initially Worked	Initial Eredication Work  Net Acreage Mumber of Mum Worked in Wild Ribes 5-E Control Areae Destroyed Man			
California	3,051,568	2,004,527	2,004,527	639,893	639,893	104,282,246	481,792	
Oregon	526,493	526,493	526,493	216,589	216,589	17,683,349	68,629	
Total	3,578,061	2,531,020	2,531,020	856.482	856,482	121.965.595	550,421	

		Reeradication	1	1	Totals		Percent		Per	Acre	
State	Acreage Worked	Number of Wild Ribee Destroyed	Number 8-Hour Man Days	Not Acreage Worked in Control Areae	Number of Wild Ribes Destroyed	Number 8-Hour Man Daye	Initial Eradication Worked	Ribe Initial Eradication	Reeradi- cation	Man Initial Eradication	Recradi- cation
California	298,123	25,663,386	171,444	938,016	129,945,632	653,236	31.9	163	86	0.75	0.58
Oregon	33,704	982,849	7,826	250,293	18,666,198	76,455	41.1	82	29	0.32	0.23
Total	331,827	26,646,235	179,270	1,188,309	148,611,830	729,691	33.8	142	80	0.64	0.54



TABLE 2

SUMMARY OF 1941 RIEES ERADICATION BY PROGRAMS
(Including all Work - Initial and Recradication)

	Total	Regula	r and Coope	rative*		WPA and ER	A.		ECW and SC	3		Total	
State	Acreage Worked (Initial and Recradication)	Acreage		8-Hour			8-Hour		Number of Wild Ribes Destroyed	8-Hour			8-Hour
California	57,679	44,968	5,013,630	25,215	7,155	287,120	3,011	5,556	1,516,167	9,077	57,679	6,816,917	37,336
Oregon	6,297	5,420	143,576	1,633	877	97,583	635				6,297	241,159	2,268
Total	63,976	50,388	5,157,206	26,848	8,032	384.703	3,679	5,556	1,516,167	9,077	63,976	7.058.076	39,604

<sup>\*</sup> Includes work done with "Lea Act" funds.

TABLE 2A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1941 INCLUSIVE

(Initial and Recradication)

State	Total Acreage Reported Worked (Initial and Reeradi- cation)	Rego Acreage Worked	llar and Coope Number of Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	WPA and ERA Number of Wild Ribes Destroyed	Number 8-Hour Man Days
California	938,016	172,633	12,907,427	65,107	412,434	69,870,817	316,770
Oregon	250,293	8,307	346,044	3,108	206,211	15,538,844	63,096
Total	1,188,309	180,940	13,253,471	68,215	618,645	85,409,661	379,866

		ECW and SCS			PWA or NRA			Emergency Pr	
State	Acreage Worked	Number of Wild Ribes Destroyed	Number 8-Hour Man Daye	Acreage Worked	Number of Wild Ribee Destroyed	Number 8-Hour Man Days	Acreage Worked	Number of Wild Ribes Deetroyed	Number 8-Hour Man Days
California	143,795	25,782,037	198,480	209,154	21,385,351	72,879	765,383	117,038,205	588,129
Oregon	7,430	354,278	2,642	28,345	2,427,032	7,609	241,986	18,320,154	73,347
Total	151,225	26,136,315	201,122	237,499	23,812,383	80,488	1,007,369	135,358,359	661,476



TABLE 3

SUMMARY OF ALL OTHER CONTROL WORK FOR 1941

		<b>3</b>	11		
	lar	Number 8-Hour Man Day	1.353	ネ	1,427
	Regular	Acreage Checked	54.127 1.353	2,636	56,763
Su	بيا	Number 8-Hour Man Days	415	56	Lt/th
Checking	Post	Acreage Checked	47,599 415	1,440	49,039
	ce	Number         Number         Number         Number         Number         Mumber         Mumber<	1465	372	66 1,010 29 56,149 837 49,039 441 56,763 1,427
	Advance	Acreage Checked	33.517	22,632	56,149
		Number 8-Hour Man Days	21	80	29
d Trees		Mumber Cankers Removed	813	197	1,010
t Infecte		Number Trees Removed	다	15	99
Treatment Infected Trees		Number Trees Treated	337	39	370
		Mumber Mumber Mumber Mumber Trees Trees Cankers Examined Treated Removed Removed	24,739	5,690	30,429
cation Survey		White Number Number Number Number Number (Amber Number Selection Number Number Number Number Number Number Number Number Number (Amber Selection Number Number Number Number Selection Number Number Number Number Selection Number Number Number Selection Number Number Number Selection Number Number Selection Number Number Selection Number Number Number Selection Number Number Number Selection Number Number Number Number Selection Number Number Number Number Number Number Selection Number Number Number Number Selection Number	8	128	218
Preeradication	Number Acres	Mapped White Pine and Pro- tection Zones	15,680	12,506	28,186
		State	California	Oregon	Total

TABLE 3A

## SUMMARY OF ALL OTHER CONTROL WORK, 1918-1941 INCLUSIVE

	Cultivate	1 Black Ou	Cultivated Black Current Bradication	cation		Murser	Mursery Sanitation	tion		Preeradication Survey	Survey	턴	Treatment Infected White Pine	Infected	White F	Ine
	Mumber	Mumber	Number		Mumber of	Number of Acres Worked	of	Number		Number Acres		Mumber	Number Number Number	Mumber	Mumber	
	of of Black Inspections Locations Currents	of Locations	Black Currents		Number Sanitation 8-Hour Zone	Maintaining Total Wild Ribes	Totel	of Wild Ribes	Number 8-Hour	White Pine and Pro-	Number 8-Hour	of Trees	of	Trees	Cankers	Number 8-Hour
State	Made	Found	Destroyed	Man Days	Found Destroyed Man Days Maintained	Zones	Acreege	Acreege Destroyed	Man Days	Man Days tection Zones Man Days Examined Treated Removed Man Days	Man Days	Examined	Treated	Removed	Removed	Men Days
California	3,298	657	8,621	2,182	1	1	24	38	22	1,204,068	3,810	65,530	331	9	813	342
Oregon	No data	1,671	52,202 No data	No data	3	3	1,856	21,814	177	361,249	1,975	7,006	39	292	197	260
Total	Total 3,298	2,328	60,823 2,182	2,182	4	ħ	1,898	21,852	793	1,565,317 5,785 72,536 370	5,785	72,536	370	322	1,010	602

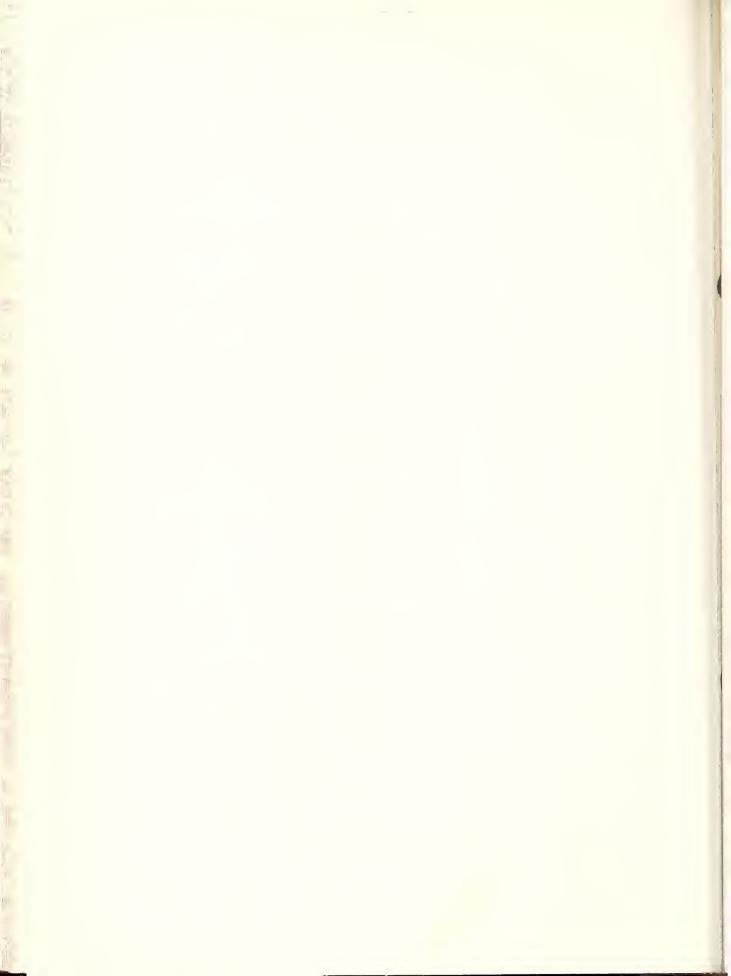


TABLE 4 SUMMARY OF EXPERDITURES FOR 1941

	Total					-	Recapi tula	Recapitulation of Federal Funds	leral Fund				
				Regular			æ	Emergency		By	By Activities (Federal and State)	Federal and	State)
	Federal (All Agencies		Bur. Ent. and Plant Quarantine	and						Supervision Includes			All Other -
	Including	Grand	Leadership &	Lon Act	Torest	Dept.	Federal	ECW	Total	State and	04,00	Pre-	Field Data,
State	WPA Projects)	Total	(3101) (3103)	(3103)	Service	Interior	MYA	scs	Funds Leaders	Leaders	Eradication	Survey	Miscellaneous
CALIFORNIA:									:				
Bureau -E.Q.	\$129,833	\$129.833	\$55,386	\$14,612			\$59,835		\$59,835	\$46,696	\$ 39,680	η16 \$	\$42,523
Forest Service	179,709	179,709			\$166,005		2,377	\$11,327	13,704	32,698	132,236		14.775
Park Service	48,717	48,717				\$35.335		13,382	13,382	6,622	39.617		2,478
Total	358, 259	358,259	55,386	14,612	166,305	35,335	62,212	602°t2	86,921	86,016	211,533	17×6	59.776
OREGON:													
Bureau -E.Q.	14,495	14,495	7,360				7,135		7,135	5,396	8,374		83
Forest Service	2,081	2,081			2,081							2,081	
O & C Admin.	17,792	17,792				17,792				1, 430	14,226		2,136
Total	34,368	34,368	7,360		2,081	17,792	7,135		7,135	6,726	22,600	2,081	2,961
Total For		,			,								
Sugar Pine Region	\$392,627	\$392,627	\$62,746	\$14,612	\$14,612 \$168,086	\$53,127	\$69.347	\$69,147 \$24,709	\$94,056	\$92,742	\$234.133	87.015	\$62,737

\*Including National Parks, Indian Reservations, and O & C.

TABLE 44 SUMMARY OF ALL EXPENDITURES, 1923-1941 (INCLUSIVE)

	Total								Recapit	Recapitulation of Federal Funds	deral Funds						
	Federal			Regular			The	Bhergency					By Activ	vities (Fede	By Activities (Federal and State)	te)	
State	(All Agencies Including State WPA Projects)	Grand	B.F.I. & Bur. Ent. Flant Quaran.	Forest Service	Dept. of Interior	Federal, WFA, CWA, ERA, NYA	State WPA	© S S S S S S S S S S S S S S S S S S S	PWA	Total Emergency Programs	Supervision (Includes State and District Leaders		Cultivated Black Currant Eradication	Mursery Canker Sanitation Elimina	Oultivated Black Ribes Ourrant Mursery Canker Eradication Eradication Sanitation	Pre- eradication Survey	All Other - (Checking, Field Data, and Miscellaneous)
California	\$4,687,363	\$4,687,363 \$637,688 \$564,588	\$637,688	\$564,588	\$35,335	\$2,364,980		\$411,407	\$673,365*	\$411,407 \$673,365* \$3,449,752 \$684,382	\$684,382	\$3,242,318	\$39,905	\$1,316		09c°η4\$	\$664,882
Oregon	878, 204	878, 204	261,458	2,377	17,792	η19,590	999,03\$ 065,674	6,814	89,507	596,577	06, 79	577.633	577.633 36.895	16,364	\$2,268	22, O49	155,905
Total	\$5,565,567	\$5,564,567 \$5,565,56? \$899,146 \$566,965	941.668\$	\$566,965	\$53,127	62,844,570	\$20,666	\$20,666 \$418,221 \$762,872		\$4,046,325	\$752,372	\$3,820,451 \$76,800	\$76,800	\$17,680	\$2,268	\$76,109	\$819,887
	Chombo mode	076 00 00-000	Contract De	The state of		Townson County	Dear les	100		the state of the s							

<sup>·</sup> Includes \$276,927 shown since 1936 as Forest Service Regular Fund program. Forest Service Regular fund expenditures reduced accordingly.



## STATUS OF BLISTER RUST CONTROL 1918-1941 INCLUSIVE

		Acres				Acres	se
State	Control Area Including Border Zones	Net Control Area Initially Protected	Control Areas Reworked Subsequent to Initial Protection*	Number 8-Hour Man Days	Number Ribes Destroyed (Wild and Cultivated)	Remaining Control Area Needing Initial Protection	Estimated Protected Area Now on Maintenance Basis
California	2,004,527	639,893	298,123	653,236	129,945,632	1,364,634	255,832
Oregon	526,493	216,589	33,704	76,455	18,666,198	309,904	110,222
To tal	2,531,020	856,482	331,827	729,691	148,611,830	1,674,538	366,054

\* Includes all reeradication acreage.

TABLE 5

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP - 1941

	Initi	Inttial Eradication	ao	Re	Reeradication			Totels	
Land Ownership	Acreage Worked	Number of Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number of Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number of Ribes Destroyed	Number 8-Hour Man Days
Mational Forests	9,388	814,749	6,908	19,475	2,754,371	9,820	28,863	3,569,120	16,728
O & C Revested Lands	3,134	114,239	1,074				3,134	114,239	1,074
onal Parks	8,113	2,109,110	10,362				8,113	2,109,110	10, 362
Subtotal - Federal	20,635	3,038,098	18,344	19,475	2,754,371	9,820	140,110	5,792,469	28,164
State and Private	7.749	465,432	4,821	16,117	800,175	6,619	23,866	1,265,607	11,440
Grand Totals	28,384	3,503,530	23,165	35,592	3,554,546	16,439	63,976	63,976 7,058,076	39,604
			NATIC	NATIONAL PARKS					
Yosem te	8,113	2,109,110	10,362				8,113	2,109,110	10,362
			STATE ANI	STATE AND PRIVATE LANDS	ANDS				
California	6,710	430,271	4,363	15,503	726,109	6,251	22,213	1,156,380	10,614
Oregon	1,039	35,161	458	614	990°†12	368	1,653	109,227	826
Total	6ηZ°Z	465,432	4,821	16,117	800,175	6,619	23,866	23,866 1,265,607	01,40

The same of the sa



TABLE 5 (Cont'd)

SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS - 1941

		Initial Work		Reere	Reeradication Work	ਮ		Totals	
National Forests	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Mumber Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man Days
				CALIFORNIA	UNIA				
KI ama th	717	29,831	363	ŝ	ŝ	ŝ	717	29,831	363
Plumas	5,146	659,148	5,016	438	12,459	167	5,584	671,607	5,183
Eldorado	2,015	108,077	1,161	2,106	123,333	1,069	121,4	231,410	2,230
Stanislaus	1	ı	8	8,207	849,244	2,804	8,207	849,244	2,804
Sierra	ŝ	ŝ	ı	8,724	1,769,335	5,730	5,724	1,769,335	5,730
Total	7,878	797,056	6,540	19,475	2,754,371	9,820	27,353	3,551,427	16,360
		i		OREGON	NC				
Si skiyou	1,510	17,693	368	ı	ţ	ŝ	1,510	17,693	368
				SUGAR PINE PECION	PEGION				
Grand Totals-	9,388	814,749	806*9	19,475	2,754,371	9,820	25,863	3,569,120	16,728

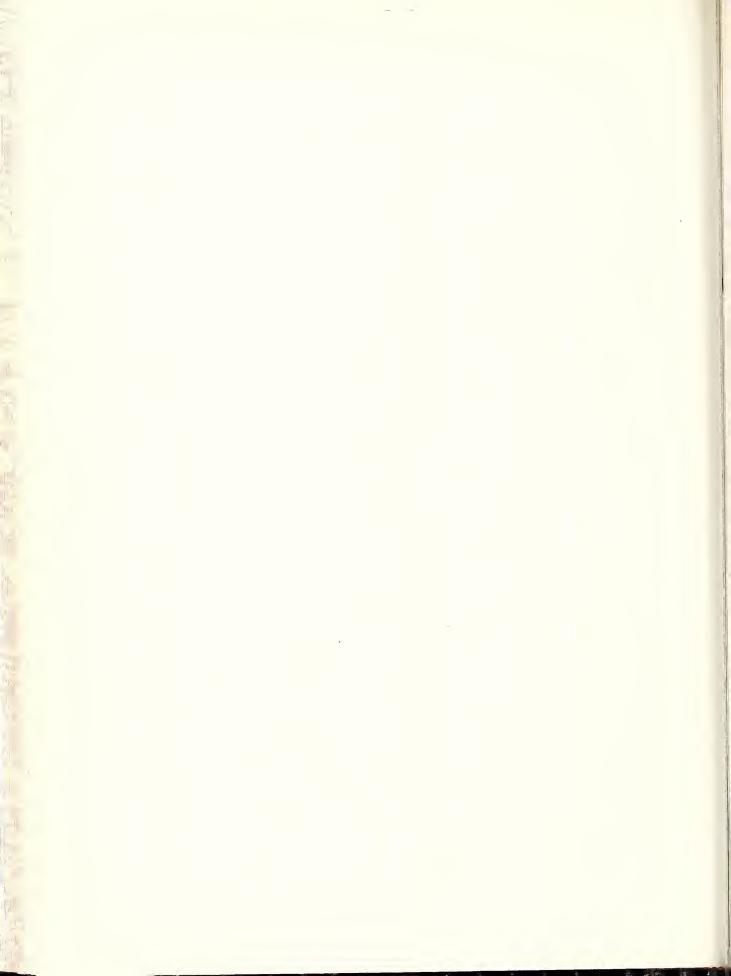


TABLE 5A SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS 1918-1941 INCLUSIVE

rk)	Number 8-Hour Man Days	344,736	98,327 450,410 279,281	729,691		363	3,868	69,691	55.84/	105,232	292,599	4 607	44,238	2,691	109	52,137	344,736		493	5.215	82,498	5,132	4,989	98,327		262,803	16,478	279,281
Totals (Initial and Rework)	Number Ribes Destroyed	77.235.777	91,638,403	148,611,830		29,831	57 <sup>4</sup> ,799	10,782,846	12 551 000 1	25, 379,057	61,184,896	419,719	15,263,131	213,330	154,701	16,050,881	77,235,777		143,592	700, 361	11,522,559	836.010	631,084	13,833,606		55,070,722	1,902,705	Fh. 973, 427
Ini)	Acreage Worked	532,231	71,868 634,182 554,127			717	8,715	107,989	126	74,199	432,652	3,739	86,105	8,843	892	99,579	532,231		3,982	13,750	46,239	3,241	4,656	71,868		437,478	116,649	55L 127
×	Number 8-Hour Man Days	93,818	105,095	179,270			375	21,562	27, 239	17,549	87,926		5,664		228	5,892	93,818		81		11,196			11,277		72,322	1,853	71.175
Reeradication Work	Number Ribes · Destroyed	16,955,858	1,919,700 18,875,558 7,770,677	26,646,235			9,462	1,896,915	5.540.012	7,321,082	16,158,970		766,931		29,957	796,888	16,955,858		13,430		1,906,270			1,919,700		7,598,146	172,531	7 770 677 1
Reer	Acreage Worked	184,241	191,977	331,827			1,339	25,792	52,257	27,788	163,079		20,950		212	21,162	184,241		350		7,386			7,736		127,658	12,192	1 20 KED
, no	Number 8-Hour Man Days	250,918	87,050 345,315 205,106	550,421	ន	363	3,493	48,129	32.259	87,683	204,673	1,607	38,574	2,691	373	46,245	250,918		412	5,215	71,302	5,132	14,989	87,050	LANDS	190,481	14,625	20E 106
Initial Eradication	Number Ribes Destroyed	60,279,919	11, 913, 906 72, 762, 845 49, 202, 750	121,965,595	NATIONAL FORESTS	29,831	565,337	8,885,931	8.014.897	18,057,975	45,025,926	1617,614	14,496,200	213,330	124,744	15,253,993	60,279,919	MATIONAL PARKS	130,162	700,361	9,616,289	836,010	631,084	11,913,906	AND PRIVATE I	47,472,576	1,730,174	10 202 750
In1 t	Net Acreage Worked	30,083	64,132 1412,205 414,277		NA	717	7,376	15 TO 25	76.869	46,411	269,573	3,739	65,155	8,843	089	78,417	347,990	M	3,632	13,750	38,853	3.241	4,656	64,132	STATE		104,457	11 277 I
Areas	Acreage Not Yet Worked Initially	761,409	183,170 1,044,037 630,501	1,674,538							614,699					146,710	1604,167		150	4°045	81,767	19,189	78,022	183,170		566,915	63,586	530, E01
	Total Acreage (White Pine and Protective Zones)	1,109,399	247,302 1,486,242 1,044,778	2,531,020							884,272					225,127	1,109,399		3,782	17,792	120,620	22,430	82,678	247,302		876,735	168,043	1.014.778
Total Acreage	of White Pine Worth Protection	1,109,399	247,302 1,486,242 1,044,778	2,531,020							884,272					225,127	1,109,399		3,782	17,792	120,620	22,430	82,678	247,302		876,735	168,043	1.044,778
	Lend Ownership	National Forests O & C Revested Lands	National Parks Subtotal - Federal State and Private	Grand Totals		Klamath	Lassen	Flumas	Stantslans	Sterra	Subtotal-California	Klamath	Rogue River	Sightyou	Siuslaw	Subtotal-Oregon	Totals		Crater Lake	Lassen Volcanic	Yosemi te	Kings Canyon	Sequota	Totals		California	Oregon	Totals

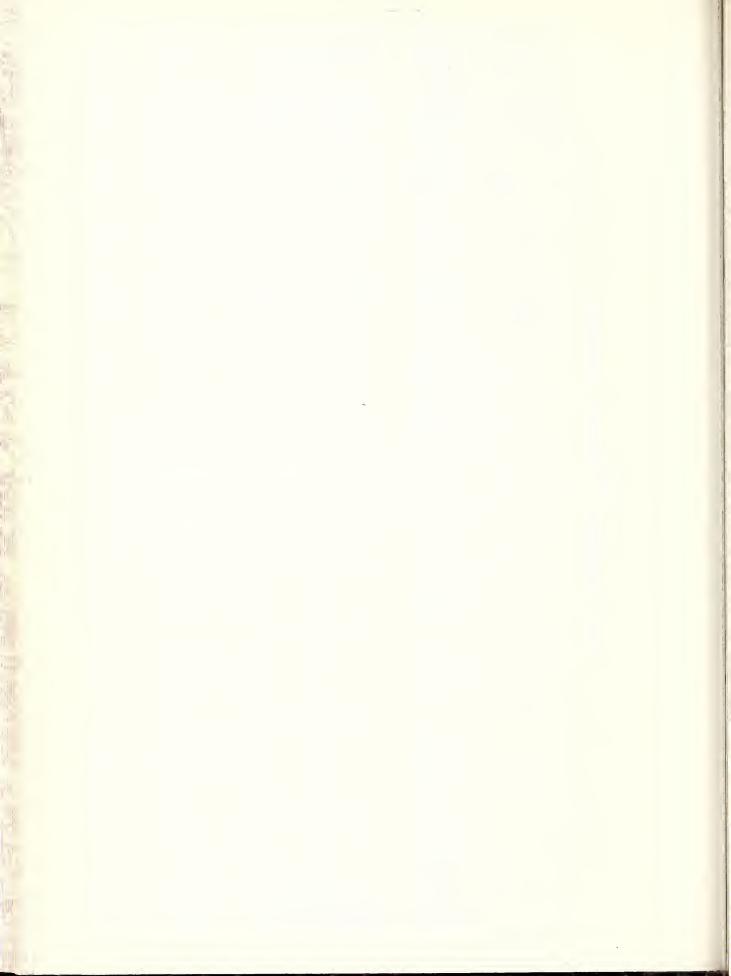
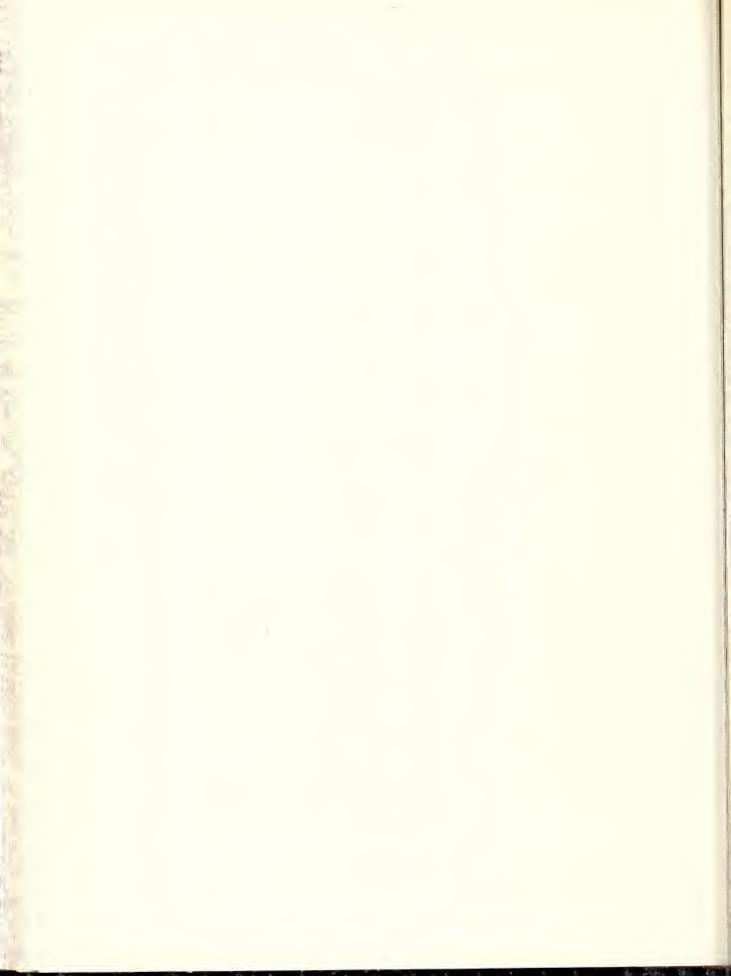


TABLE 6

SUMMARY OF RIBES ERADICATION WORK ON MATIONAL FOREST LANDS, 1932-1941 INCLUSIVE

¥,	Acreage of					Acreage	Acreage Worked by					To	Total Acreage Worked	Worked .			
-	Mational	_		Forest Sarvice	vice.			Bureau	an		0 % 0		by All Agencies	ncies		Total Acresge	
Con	Forest Lands in Control Area	Calendar	First Working	Sacond	Addi- tional Rework	Totals	First	Second	Add1- tional Rework	Totals	First	First	Second	Addi- tional Rework	Totals	According to Present Ownership Unworked (Initial Erad.) Acreage	Unworked Acrsage
Mational Forests - dorado enath ssen undecino unds quoia	884,272	1926–38 1939 1940 1941	129,496 6,118 12,810 7,878	22,770 45,113 28,976 5,630	6,084 1,294 1,461 10,585	158,350 72,525 43,247 24,093	96,281 16,550 140	22, 281 9,548 3, 260	4,573	123,701 16,550 10,926 3,260	1 1 1 1	225,777 22,668 13,250 7,878	45,617 45,113 38,524 8,890	10,657 1,294 2,399 10,585	282,051 69,075 54,173 27,353	269,573	614,699
		Total	156,302	102,489	13,61	278,215	113.271	35,655	5,511	154,437	1	269,573	138.144	4. 0.43	432,652		
						-											
National Forests -	225,127	1925-38	525	8,2	1 1	209	58,319	21,958	7772	80,521	1 1	58,841	22,043	75.7	81,128	78,417	146,710
		1940	158	2tt -	85	285	3.876	1 1	. 1	3,876	671 1,510	1,510	245	. e	1,510		
Sluslaw (Mt. Hebo Plantation only)																	
		Total	089	127	85	892	78,165	21,958	718	100,841	2,181	81,026	22,085	803	103,914		
Totel 1	1,109,399	1	156,982	102,616 19,509		279,107 191,436	191,436	57,613	6,239	255,278 2,181		350,599	160,229	25,738	536,566	347,990	761,409

Includes 5,535 acres of Federal lands worked by the State of Oregon WRA Project.



PART II

EDUCATIONAL WORK

By

John C. Crowell, Agent

This report covers educational activities in the Sugar Pine Region during 1941. The purpose of this educational work was to keep the public informed of the status of blister rust in the Sugar Pine Region, of the significance of the disease to the western pine areas, and of the progress made in the control work.

## METHODS

Three methods of reaching the public were used, namely:

- 1. Illustrated lectures, using the blister rust colored motion picture
- 2. Radio broadcasts
- 3. The use of a diorama exhibit at county fairs

The availability of the motion picture and the diorama display made the work possible and convenient. The motion picture film had been revised and improved during the spring of 1941 and had been shortened to 25 minutes duration. Since the film was primarily made for instructional work in eradication camps, it was shown to the laborers and the supervisory staff in many of them. The diorama exhibit, made by the Office of Exhibits of the United States Department of Agriculture in Washington, D. C., was shipped to California in 1940. It was suitable for displaying at the county fairs and was readily handled by one man. Radio broadcasts were made possible by the cooperation of the Western Office, Radio Service of the U. S. Department of Agriculture.

## WORK PERFORMED

The blister rust motion picture was shown to the personnel of 14 eradication camps on six operations as part of the regular training program. The film was also shown at 20 group meetings having an attendance total of approximately 4,380 persons. These groups included the U. S. Forest Service Ranger School, Crater Lake National Park School, University of California

pathology class, East Bay Federal Business Men's Association, Yosemite Park public gathering, and the Exchange Club of Berkeley, California.

Three radio broadcasts were presented on the "Western Agriculture" program, which is normally broadcasted over the Red Network of the National Broadcasting Company and carried by some 12 western stations.

The scripts were in dialogue form and presented generally certain phases of blister rust control work in the western states.

The diorama exhibit presented the story of blister rust to the people by means of a modeled forest scene depicting eradication practices and scouting for blister rust. Specimens of the host plants infected with the disease illustrated the effect on Ribes leaves and pines. The exhibit was displayed at eleven county fairs during the summer as listed in the following table:

## EXHIBITIONS OF DIORAMA IN 1941

Name of Fair	Location	Total Attendance	Viewing	Number Pe <b>o</b> ple Viewing Exhibit
Calaveras County	Angel's Camp	4,500	80	3,600
Butte County District	Chico	12,000	80	9,600
Mariposa County	Mariposa	7,000	80	5,600
Placer County District	Auburn	13,000	80	10,400
Alameda County	Pleasanton	65,000	50	32,500
Santa Barbara Fair	Santa Barbara	30,000	80	24,000
Contra Costa County	Antioch	25,000	85	21,250
San Joaquin County	Stockton	130,000	50	65,000
California State	Sacramento	550,000	40	220,000
Tuolumne County	Sonora	6,000	20	1,200
Madera County	Madera	30,000	50	15,000
Total For All Fairs		872,500	the contract of the contract o	408,150

The percentage of visitors at the several county fairs viewing the exhibit was influenced by the favorable or unfavorable location of the diorama and to a certain extent by the interest of the local residents in conservation matters.

An assortment of informational pamphlets pertaining to blister rust and the control work was placed on a small table in front of the exhibit for distribution to the public. Approximately 6,000 pieces of literature were dispensed in this manner. It was necessary to conserve the literature because the supply was limited. Usually only one type of pamphlet was placed on the table and always it was necessary to discourage children from collecting them.

### DISCUSSION OF RESULTS

The chief value of the blister rust motion picture in educational and instructional work may be considered not so much to dress up the lecture, as to give the essential basis for understanding it. The use of a film to to present a technical subject appears to be a satisfactory way of making blister rust control facts and details understandable by the laity. Favorable comments from the audience following the showing of the picture bore out this assumption.

Radio broadcasts may cover a wide area and reach many thousands of people. In the case of the "Western Agriculture" program it is believed that the audience was largely rural and somewhat restricted in number by reason of the early morning hour. Broadcasting companies are usually cooperative in making time available on their programs for blister rust control scripts. In the case of the three broadcasts given in 1941 particular mention must be made of the assistance and cooperation of Mr. Kenneth M. Gapen who made it possible to tell the story of blister rust control over the National Broadcasting Company chain.

The use of the diorama in educational work is a simple and easy method of presenting blister rust control information to the public. A short speech of one or two minutes by an attendant will cover such points as the spread of the rust over the Sugar Pine Region, the importance of control work, and the progress made in stemming the disease. The scope of this form of educational work is recognized by the fact that more than 400,000 people were acquainted with the control program during the summer of 1941. The comments by the spectators upon the excellence of the display was a great satisfaction at all times. The cooperation of the fair managers was likewise satisfactory, and the Bureau of Entomology and Plant Quarantine was graciously invited to participate in future fairs.

Some consideration may be given to the advisability of exhibiting at smaller fairs as was done during 1941. Where the cost of doing so is relatively high in view of the small number of persons attending, an arbitrary minimum attendance figure of 12,000 is suggested. There are approximately 25 fairs in the state that would still be available even with the application of the suggested minimum figure. If the maximum number of people are to be contacted during the season, the Los Angeles County Fair at Pomona offers at opportunity because of the 800,000 people attending. This fair has grown during recent years and now exceeds in attendance the California State Fair at Sacramento by more than 250,000 people.

### RECOMMENDATIONS FOR FUTURE WORK

While it may be impractical at this time to make a definite plan for educational work during 1942, the possibilities of doing so may be discussed. The blister rust film will again be valuable in connection with lectures presented to organized groups and classes. This realm of the educational work can be expanded almost at will since the public's interest in conservation work appears to be at an unusually high level.

The use of radio programs is a field that requires only intermittent attention. Frequent broadcasts over one network of stations is to be

avoided to prevent over-publicizing and undesirable repetition. The limitation of suitable script material on the subject of blister rust control imposes a severe handicap in the wide use of the radio for educational purposes.

Since the diorama used during the current year will not be available in 1942, any further educational work of this kind will necessitate the building of an exhibit or securing one from the Washington Office of the Division of Exhibits. The use of the blister rust motion picture as a part of an exhibit, if built, is not recommended because the people at county fairs move along with little hesitation; furthermore, a miniature theatre would be required. It might be possible to build an exhibit around a Baloptican slide projector machine. Supplementary features of an exhibit might include enlarged, colored photographs pertaining to blister rust control work, and an array of sugar pine products. On a somewhat larger scale it might be possible to create an interesting exhibit using wooden models of airplanes, automobiles, or of certain national defense products, carved from sugar pine. These might be secured from the airplane and automobile manufacturers through governmental channels.

### PART III

### RIBES ERADICATION

Вy

Roy Blomstrom and Conrad P. Wessela
Associate Foresters





### INTRODUCTION

This report summarizes the Ribes eradication work for the Sugar Pine Region. Control work in California was performed on the Klamath, Plumas, Eldorado, Stanislaus, and Sierra National Forests and Yosemite National Park. while the Rogue River National Forest and Siskiyou National Forest on lands of Oregon and California Revested Lands Administration were the scene of eradication activities in Oregon.

Eradication activities were influenced by (1) the development of widespread and relatively heavy intensification of rust in southern Oregon and northern California, (2) the curtailment of the large scale ERA and CCC programs, and (3) the beginning of Ribes eradication with regular funds by the Bureau of Entomology and Plant Quarantine, the National Park Service, and the Oregon and California Revested Lands Administration.

The results of the work are summarized by state and operation in Tables 1 to 5. Table 1 is an accumulative record of the status of the work since its inception in 1926. The remaining tables summarize the work performed during 1941. Maps of each operation are attached depicting in color the area covered in this season, work performed prior to 1941, and the area remaining to be worked.

### ORGANIZATION AND ADMINISTRATION

The curtailment of the ERA program on June 30 and the reduction in the number and the size of the CCC camps reduced the 1941 operation to 39,604 man days. This is the smallest operation since 1932 and constitutes a 60 per cent reduction in the number of man days that have been expended annually since 1935.

The four Federal agencies which conducted Ribes cradication programs were the Bureau of Entomology and Plant Quarantine, the U. S. Forest Service, the National Park Service, and the Oregon and California Revested Lands Administration. The following tabulation shows by states the agency administering the camps, the type of fund under which the camps operated, and the man days expended.

	/	Type of Camp	Number of Camp	Man Days
<u>California</u> :	Forest Service	Regular	8	18,445
	Forest Service	CCC	3	3,770
	Bur. Ent. & Plant Quarantine	ERA	3	3,044
	Bur. Ent. & Plant Quarantine	Regular	2	1,715
	National Park Service	Regular	2	5,055
	National Park Service	CCC	3	5,307
Oregon: -	Bur. Ent. & Plant Quarantine	ERA	2	635
	0 & C Revested Lands Admin.	Regular	2	1,633
	Total	s <b>-</b>	<b>-</b> 25	39,604

### CALIFORNIA

### Klamath National Forest

Early in June the Forest Service established a 33-man regular fund camp on the Beaver Creek Unit. Owing to an exceedingly favorable season for rust intensification, the local Ribes infection, resulting from many small sugar pine infection centers scattered throughout the area, intensified and spread to practically every Ribes sanguineum on the area. Because of this heavy intensification of rust the camp was increased to 70 men late in July to eradicate as many of the Ribes as possible, thus preventing the rust from returning to the pines.

The area worked this season was confined to the Hungry Creek Basin on the California side of the Oregon-California State line and joined the area which had been worked in Oregon during 1940. The timber on this area was heavily logged about 20 years ago but now supports an adequate stand of sugar pine. Ribes sanguineum, the most abundant species of this genus present, were exceptionally large which made their removal difficult.

### Plumas National Forest

One CCC camp and three regular fund camps financed by the Forest Service constituted the Ribes eradication program on the Plumas National Forest during the summer of 1941.

One regular fund camp located on Estray Creek completed all the reeradication work in the unit by the middle of July and began initial
eradication on adjacent cut-over lands. Although the timber from a large
portion of the area covered on reeradication had been logged subsequent to
initial Ribes eradication, Ribes regeneration was negligible except along skid
roads and logging trails.

The initial eradication program, started in 1940 near the western edge of the forest in Granite Basin, was continued this season with enrollees from the CCC camp and from one regular fund camp. The remaining regular fund camp was located in the Big Bar Unit near the western boundary of the forest. Initial eradication was completed and the camp disbanded in August.

A D-2 tractor with a special Ribes grapple (described in previous reports) was put into operation on the Plumas during the late summer and continued to work until early November. Several areas of exceedingly heavy Ribes concentrations in Granite Basin were eradicated of Ribes by this method. The machine was then moved to Mooreville Ridge on the southern end of the forest where it was used to remove Ribes concentration in a five-chain wide belt around portions of the Lost Creek burn.

### Eldorado National Forest

Ribes eradication was continued on the Eldorado National Forest in the vicinity of Matson Mill and Caldor, and in the Silver Creek Basin by two 75-man ERA, one regular fund, and one CCC camp.

The Bureau ERA camps in the basin of Silver Creek operated from early May until June 30 when a delay in the allocation of additional funds and the inability to secure certified workers made it necessary to close the camps. The work was contiguous to that done in 1940 and consisted of Ribes eradication on areas worked initially in 1934.

The CCC program began early in April with the assignment of 25 enrollees from the winter camp at Mosquito to initial eradication in the vicinity of Slate Mountain. The camp was later moved to its summer location at Caldor where initial and recradication work was continued intermittently with a small complement of men until late summer.

The Forest Service regular camp completed the reeradication necessary on the southern end of the forest and then did initial eradication on adjacent areas until the end of the season in late September.

### Stanislaus National Forest

The Ribes eradication program on the Stanislaus consisted of 3 camps. The Forest Service operated one 33-man regular fund camp at Bumblebee from early May until late September. The bulk of the work consisted of second reeradication of Ribes from areas worked initially in 1933.

The Bureau operated one 75-man ERA camp during May and June. When the ERA program was curtailed on June 30 the ERA camp on Beaver Creek was converted into a 33-man Bureau regular fund camp. In addition to the ERA camp, the Bureau operated a 33-man regular fund camp on Hayward Creek from June 16 to

the latter part of August. The Bureau camps were engaged in reeradication work from virgin timbered areas covered initially in 1933 and 1934.

### Sierra National Forest

The three camps doing Ribes cradication work on the Sierra National Forest were all operated by the Forest Service. Two were 33-man regular fund camps, and one a CCC camp located at Soquel. The Soquel CCC camp began eradication work late in May and terminated late in July. Reeradication of Ribes from cut-over lands worked initially from 1935-1938 constituted the bulk of the program.

The two regular fund camps began operating early in May and continued with reeradication work on Footmans Ridge and Chowchilla Mountain until late September. The regeneration of Ribes in this area is exceedingly heavy. The area was logged approximately 20 years ago.

### Yosemite National Park

The National Park Service received, for the first time, an allotment of regular funds for blister rust control work. Funds allotted to Yosemite National Park became available on July 15. Two camps were established — one in Yosemite Valley on July 17 with 66 men, and the other with 33 men at Tamarack Flat. The dense concentrations of Ribes within the work area made it possible to do effective work with these camps until late October.

The CCC program, consisting of three camps, expended 5,307 man days on Ribes cradication. This is approximately one-sixth of the number contributed in 1940. The reduction in number of effective man days was due to the low enrollment in the camps and to a very short working season. The Wawona camp ceased Ribes work on July 18, and the remaining two camps about August 20.

### OREGON

### Rogue Rivor National Forest

A Federal agency ERA project was approved in September and the Bureau used 15 ERA men for two months on reeradication work on the Pinehurst Unit. No camp was established since it was possible to transport the men by truck from their homes in Klamath Falls, Oregon, to and from the job each work day. The area was worked initially in 1936 but since that time the timber was logged, resulting in a comparatively heavy regeneration of Ribes lobbii on the more favorable Ribes sites. Because the program was not large enough to cover all the area in need of treatment, spot working of heavy Ribes concentrations was resorted to in an effort to delay the rapidity of intensification of rust infection.

### Siskiyou National Forest

Plans were made and money allotted for a 75-man ERA camp to be operated by the Bureau at Swede Basin. After considerable effort, 30 men were finally made available to this project early in May. Since all unexpended funds were frozen on July 1 and no new allotments were made, the camp was closed

on June 30. Later in July this camp was reoccupied by the Oregon and California Revested Lands Administration.

On July 21, two 33-man regular fund camps were placed in operation on the Siskiyou by the Oregon and California Revested Lands Administration. Bureau equipment then on the ground was used to facilitate establishment of camps. One camp located at Swede Basin expanded initial control work started by the Bureau during June. The area covered this season supported the heaviest Ribes population yet found on the Siskiyou. With the rust near, it was considered advisable to remove these heavy concentrations as rapidly as possible.

The second 0 & C camp was located in the West Galice Unit near the Bunker Hill Mine because of the presence there of two known blister rust infection centers and of comparatively heavy concentrations of Ribes bracteosum in the stream type within the unit boundaries. Ribes populations were light except along the streams.

In addition to Ribes eradication work the 0 & C Revested Lands Administration financed a six-man combination reconnaissance and checking party on the Siskiyou Forest. It was used in systematically inventorying sugar pine and in studying Ribes conditions prior to Ribes cradication. A total of 9,082 acros were covered by this crew, and the results obtained proved valuable in establishing definite boundaries for the control unit where only provisional boundaries existed heretofore.

### DISCUSSION

An important development during the season of 1941 bearing on the establishment of the rust and the methods of eradication was the extremely rapid development and the vast amount of infection found on R. sanguineum on the Klamath National Forest. Of 208,736 bushes eradicated, approximately 26,000 were infected with rust, and about 90 per cent of the infection was on R. sanguincum. The outstanding factor in the behavior of the rust on this species was the rapidity and scope of uredinial intensification from leaf to leaf and from bush to bush caused by intermittent showers and cloudy days, which occurred every few days throughout the summer. As a result all concentrations of R. sanguineum, particularly those on the more moist north and cast facing slopes, were heavily infected, and on those slopes considerable sugar pine damage is expected despite the eradicative efforts of this season. Considerable pine infection certainly occurred before the cradication of the heavy infection centers. This year about 150 infected sugar pine trees were discovered throughout the Hungry Creek basin. These trees were originally infected in 1937 as a result of scattered Ribes infection in that year. Despite eradicative efforts, much more pine infection is sure to result because of the much greater number of infected Ribos present in 1941.

In southern Oregon and northern California and to some extent on the Plumas National Forest the presence of rust within or near control unit boundaries influenced the selection of areas for work, and to a less extent the methods of work. Since the control program was not large enough to cover all areas, spot working of infection centers and of heavy Ribes concentrations was resorted to in an effort to delay the rapidity of intensification and to

lessen the incidence of rust infection. By working the infection centers the rust is not only held in check on these local areas, but also the source of spores which would threaten adjacent areas is removed. Future work will undoubtedly be influenced more by this factor.

One of the greatest obstacles to maintaining an efficient field organization throughout the season was a constantly changing and fluctuating camp personnel. Labor for the regular camps throughout the region was secured locally through the various employment offices and recruited from colleges. Labor turnover was high; training men was a continuous process, and inexperienced men were always present among the field crews resulting in inferior and lowered production.

The ERA program was reduced from 56,319 man days in 1940 to 3,679 man days in 1941. This large reduction was caused by the curtailment of the program and the inability to obtain enough certified workers to utilize the ERA funds available. At the termination of the ERA work on June 30, forty men were chosen from the ERA camp personnel and given employment in regular fund camps. The quantity and quality of work of those hand-picked men compared favorably with the production of other regular fund employees.

The CCC camps engaged on eradication work were undermanned throughout the season. The personnel was reduced so low in several camps that they were disbanded during the middle of the summer. The number of effective man days expended by the CCC camps this year was 9,077 or approximately 1/6th of the number contributed annually during the past three years.

The Bureau maintained headquarters at each Forest Supervisor's office. Service and supply for both Forest Service and Bureau camps was conducted on a cooperative basis through Forest Service facilities.

A Bureau staff man was stationed at Medford, Oregon, to supervise Bureau activities and to furnish technical supervision for cooperating agencies in accordance with prearranged agreements. Service and supply and clerical work for the 0 & C Revested Lands Administration were handled through their District Ranger's Office in Medford, Oregon.

The work on Yosemite National Park was administered through the regular channels of their local superintendent's office. Technical supervision was furnished by a Bureau representative.

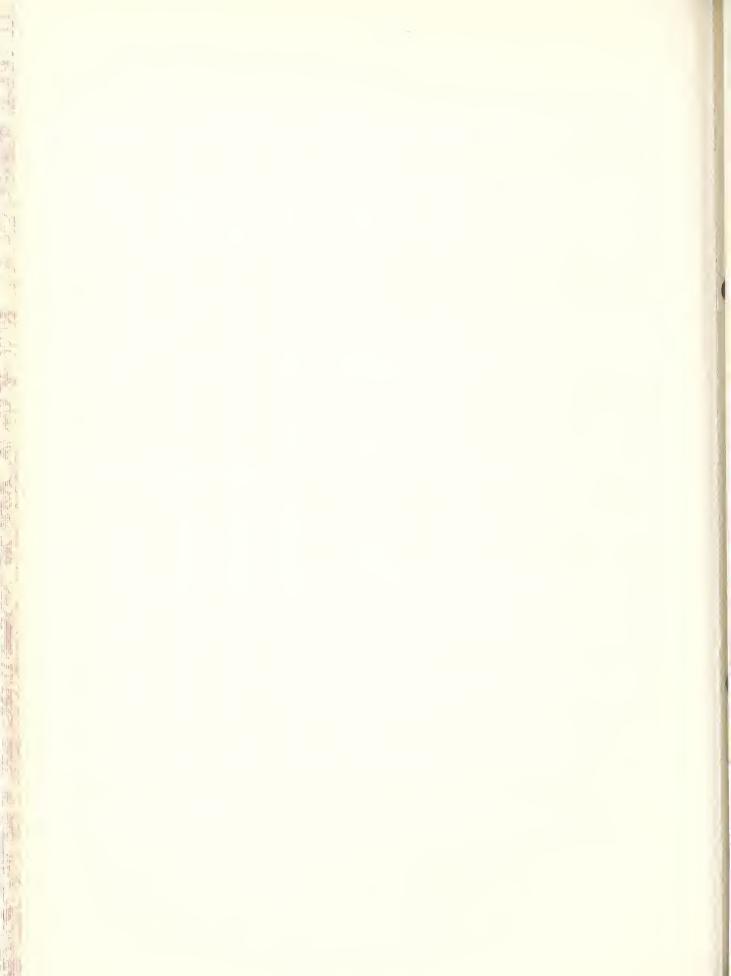
THE STATUS OF RIBES READICATION BY LAND OWNERSRIP IN THE SUGAR PIER REGION AS OF DECEMBER 31, 1941

TABLE 1

PART A - California

Man				reage of Co	ntrol Unit			1				Statue of	Eradication					
The column   Column	Control Unit		Maite and Sugar Pine Type	Bon-White and -Sugar Pine Type	Total	Acreage Unworked	Acres Worked	₽ , e	Ribes		Men Daye	Ribee	Acres Worked	Han Days	Bi bee	Acree Worked	Man Daye	
The column   The								M	ATTORAL FORE	STS								
1985   1985	Vendocino	Federal	16,290															
19   19   19   19   19   19   19   19	Hational Forest	State	Οħ	. 1	1 1	1 1												
Thirties   1,500   1		Total	107,288		- 1													
The column   The	Trinity	Private	37.214	11	1 1	1												
The column   Column	detional Forest	Total	146,537		1 1													
The part   The part	Klepath	Federal	14,840		- 1			363	29.831							71.7		
The control of the	Bational Forest	Total	15,200	ы	ŀΙ	1 1	П	2,881	208.736							4,358	Ш	
	Sheeta	Private	60.970	1	- 1													
Name   1980   1981   1982   1982   1983	Hationel Forest	Total	63,585	Ш	1 1	1	Н	1										L
	Topon	Federal	105 996			1	1	- 1	2 200 671	1,339	3 175	9,462				8,715	L	
The control	Bational Forest	State	1,015	1.1	1 1	1 1	1.1	1 1	1000			-				1024	11	1 1
The column   The		Total	247,451	1				23,830	2,964,008	6,349	2,554	210,063			110 111	⊥	1	- 1
Thirds	Plumae	Private	110,352			1	11	42,597	8,316,989	31,028	19,761	2,279,797	Ш	Ш	45,338		Ш	$\perp$
Tright   T	Mational Forest	State	200	1					4,620	, F88	200 00	1 067 277			164 770		Ľ	ш
	0.44.6	Federal	16,35	1			1		04(1)01	04,700	000,00	4,001,00,0	2,00	10/17	101	L		
Printed   1985	Hetional Forest	Private	18,063															
Figure   100,000   13,400   14,500		Total	34, 588					345 68	0 143 000	0	100	174 174 1		400	011	1	0.10	- 1
	El do rado	Private	106,039	1				46,924	12,351,587	33,455	061.00	1,699,759	L	27	7,406	L	67, 661	
Process   Proc	National Forest	State	2.122					1.634	310.891				Ш				11.64	11
		Federal	75,548	1				12.35	8.014.897	Д.,	19.623	264.689	$\perp$		1.270.121		59,598	
	Stanielene	Н	107,911			Ш		52,545	17.982, 584	Ш	2.837	2,714,858	Ш	Ш	97,655	Ш	78,944	11
Printer   111.34   15.20   11.20   1	Mational Forest	Ш	183,779			-		84,933	26,014,349		45,460	6,984,547	$\perp$		1,367,978			-
	9		117.141	- 1			- 1	87.683	18.057.975	L	14,608	6,341,035			740.086	Ш	11	}
Prince   155,000   15,000	Mational Forest	П	01	1,500	100	11	-	307	7.100.60	Ш	- 5.43	CONTRACTOR OF THE PARTY OF THE		Ш	10.00	1 [		Н
	0.000		159,043	63.470	222,513 ht 940		62,567	112,065	23,766,198	28,541	17,062	6,872,755	4,712		996,247	95,820		1
	Mational Forest	П	9.120	9.760	16.860	Ш												
			656.169	228.101	884,272		269,573	204.673	45.025.926	1	75.4.14	13.762.421	$\perp$	- 1	2, 396, 549			
Parista   1,561,357   17,575   17,575   17,175   17,127	Total All	П	719, 198	143.594	862,992	Н	304.763	187.103	46.937.059	Щ	70.724	7.426.755	Ш	11	166,599	ш	1 1	
Private   Protest   4,972   12,650   11,1792   4,042   11,170   5,25   14,042   11,170   5,25   14,042   11,170   5,25   14,042   11,170   5,25   14,042   11,170   5,25   14,042   11,170   1	Mational Forests		1,381,539	372,365	753,904	-	577,385	393,760	92,295,264	292	146,158	21,189,176	28,438	1	2,563,148	3.049	- 1	
Triange   Printer   1,000   11,100									APTORAL DAGE									-
Proteste	Lessen Volcanic	Federal	4,972	Ш			Ш	5.215	700.361							13,750		
Private   Priv	Nationel Park	Private	4 972					5,270	14,977							140		
Print   Prin	Tosenite	Federal	77,236			П	Ιİ	71,302	9,616,289	Ц	11,196	1,906,770				46,239	П	1.1
Product   15,805   6,656   22,305   19,189   1,241   5,132   19,189   1,364   1,365   11,196   1,905,770   15,180   1,566   1,365	Bationel Park	Total	77,736					71,302	9,616,289	7,386	11,196	1,906,270				46,239		1
Fried   6c 5c   2c   2c   2c   2c   2c   2c   2c	Einge Canyon Hational Park	Federal	15.805	9	22.430		1,241	5.132	676.010							177		
February   100,575   87,575   185,025   185,	Sequota		69 69		1	1		1, 090	100 129							1) (6)		1_
Performe   15, 076   2, 150	Total All	Federal	160,575		1			86,638	11.783,744		11,196	1,906,270				67,886		
	Mational Parks	Private	161.075		1 1	} [		86.693	11.798.721		11.196	1,906,270				140		Ш
Perform   1.050   1.					1				CHAMP DADED									
State   1800   2100   2.150   1.150	Total T	Private	1,040		L				SIAIL FARM									
Tries	State Park	State	880															
State   1,658   355   1,971   2.55   1,178   1,178   2.55   1,178   1,178   2.55   1,178   1,178   2.55   1,178   1,	lowers Die Gree	Private	138	'					3,260							120		
Private   1,150   1,50   1,30   1,30   1,30   1,31   1,15   1,1	State Park	State	1,618						185,001	212	3,5	4,792				1,963		
State   2 498   555   3,133   1,355   1,146   1,136	Total All	Private	1,160		П			П	3.260		1	-				130		Ц
Pederal   816.744   11.048   1.127.792   797.719   310.071   291.711   56.809.670   115.666.691   24.935   12.492   2.196.2449   500.618   390.411     Protecal   816.724   11.048   1.127.792   797.719   310.071   291.711   4.936   311.719   4.936.711   4.936   311.718   4.937   4.936   311.718   311.718   4.936   311.718   311.7	State Perks	State	1.658					- }	185,001	215	88	4,792				2,063		193,053
Pedgeral   S16,744   111,048 11.27,732   797.7129   7									TOTAL									
State (2.170) 2.173 (3.174 (3.		Federal	816,744	1 1	1,127,792	797.719		291,311	56,809,670	121 010	86,630	15,668,691	Ш	1 1	2.396.549		390,431	
Total 1,546,272		11	8,470	145,504	9,773	4.976		3,102	517,280	215	92	4.792	$\perp$		127	1 1	3,128	
			1,546,272	458,355	2,004,527	1,364,634	639,893	181,7921	04,282,246		157,380	23,100,238	Ц		2,563,148	938,016	653,236	129,945,63

H.B. - The changes in acreage of control units appearing in this table are the results of a rectanishment and a reclassification of units in 19th.



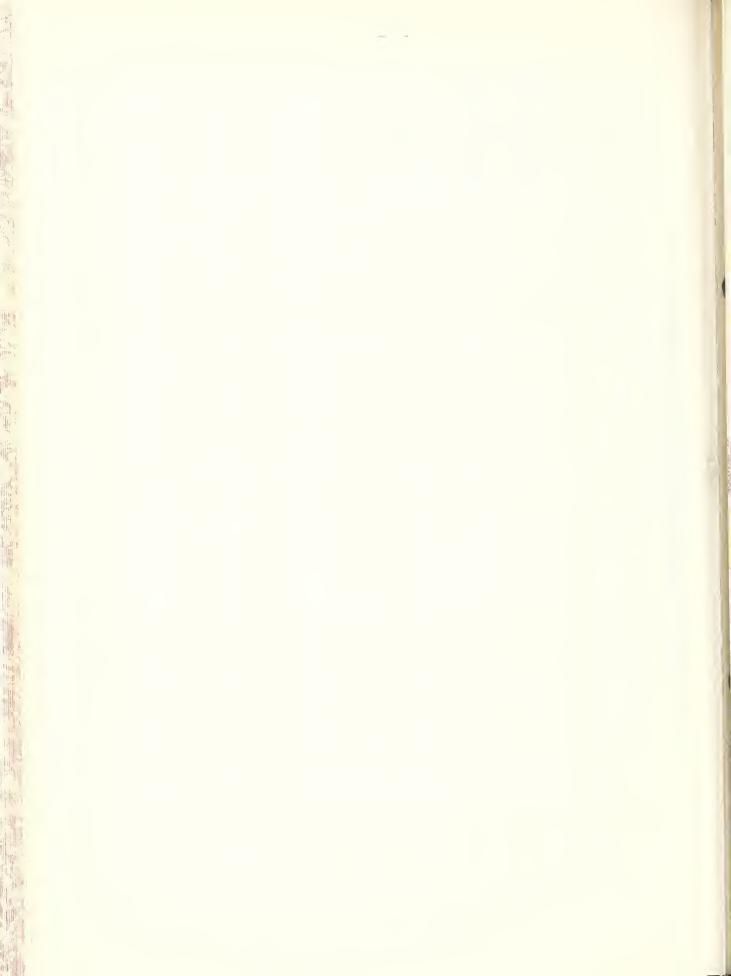
### TABLE 1 (CONTINUED)

# THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE RECION AS OF DECEMBER 31, 1941

PART B - Oregon

		Acr	Acreage of Control	ntrol Unite							STATUS OF						
	5	۱.	Non-White			E	First Working	35	Sec	Second Workin		Additional		Forkings	Total	All Workings	9.59
Control Unit	of Ownership*	Sugar Pine Type	, e	Total Acreage	Acreage Unworked	Acres	Men Deys	Ribes	Acres	Men Days	Ribes	Acres	Men Days	Ribes	Acres	Men Deys	Ribes
							HAT	NATIONAL FORESTS	TS								
	National Forest		4/2,1	160.6	5,292	3,739	14,607	419,719							3,739	4,607	419.719
L smath	0 80 80 C	Ц			4.573		,								-		75147
National Forsat	Frivate	11,835	1,79	13,604	723	3,739	1,882	113,810							3,739	1.882	419,719
	State	1 1	-		1 0	1	1										1
	Total	1			10,588	4.508		533,729							4,568	684.9	533,529
	Forest	1			22,336	65,155		14,496,200		5,468	757,818	t1/t1	196	9,113	86,105	Wt. 238	15,263,131
Mational Forest	F Total	1		104,841	34,32	70,549	39,728 1	14.692.571	92,476	5.468	757,818	ή <u>/</u> ή	1961	9.113	91.499	1,154	15 459 502
	Privete	63, 208	15,802	1.	9,107	69,903		1,105,988		1,853	172,531	1	,		82,095	8,755	1,278,519
	Total	147,081	36,770	183,851	43,399	140,452	46,630	15,798,559	32,668	7,321	930,349	7/17	196	9,113	173.594	54.147	16.738.021
	National F	_				0 0113	-	110							a day	3	
Siskiyon	90 90 90 90 90 90	86,241	15,219	101,460	76,771	24,689	6,193	372,649							24,689	6,193	372.649
National Forest	F. Total	4		1 1		33,532	1 1	585,979							33,532	8,884	585,979
	State	1		- 1		2001		8, 128							32,595	5,446	497,029
	Total		37.	$\vdash$		66,427	1 !	1,091,336							66,427	14,373	1,091,336
	Mational Forest		12,071	60.353	60,353												
Umpque	90 80 0			6,158	6,158												
National Forester	Private	53,209		8.266	8,266												
	State	256			320												
	Totel	1	15,019	15,097	75.097												
;	Forest	183,568	40,879		146,710	77.77	45,872 1	15,129,249	30,476	5,468	757,818	11/11	196	9,117	98,687	51,536	15,896,180
Total All	160 100 100 100 100 100 100 100 100 100	$\perp$			246.168	107,820	53,219	15,698,269		5. 46g	757 R18	11411	196	2110	30,083	- 1	569,020
	Private	H	Ш		62,848	103,327	14,230	1,716,827	12,192	1,853	172,531	-	-	7444	115,519	16,083	1,889,358
	State	430,334	90,817	521,151	309,704	211,447	67,492 1	17,423,424	32,668	7,321	930,349	7,47	196	9,113	300		18.362.886
							MA	TOWAT DADE	١.								200120702
Crater Lake National Park	Federal	3,374	801	3,782	150	3,632	412	130,162	350	81	13,430		-		3,982	1493	143,592
							NURSERY	03	ION								
McDonald	Privets	1	418	118		418	178	2,547							418	178	2,547
Clark McNary Mursery	Total	0018		880	50	830	352	5,019							830	352	5,019
						20	MT. HEBO WE	WHITE PINE PI	PLANTATION								
Siuslaw Mational Forest	Federal	140	540	089	'	089	373	124,744	127	137	19,131	85	91	10,826	892	601	154,701
								TOTAL									
Total All	Federal	136,916	62,342	358,450	246,318	112,132	54,004 14,408	15,953,175	12,192	1.853	172.531	559	782	19,939	133,644	16.977	16,763,493
Control Units	State	1:33 46	909			712	712	10,800		1 2					712	21.7	10,800
On the state of	10001	1070	36,06/	270,435	105,504	C10,289	50	1, 100, 1, 199	12,147	1666.	962,910	559	2871	19,9391	300.2331	75,455	18.666,198
<ul> <li>Ummersally as of reordary 13, 1935.</li> <li>** Ownersally 10,128 acres of federal land controversiel as Mational Forest Lands.</li> </ul>	rebruary 17, 128 acres of	. 1939. f federal la	nd controve	ersiel betw	reen United	States Fo	rest Servi	ce and Orse	gon and Cal	lifornia R	between United States Forest Service and Orsgon and California Revested Lands Administration.	de Adminît		In these co	In these computations this acreage classed	this acrea	ge classed
** Sixteen acres of Nursery and two acres of planted pine	Nursery en	d two acres	of planted		in Arboretum.												
						6		4									

	Federal	11,112,85	2 373,3	340 1,46	86,242	1,044,	037 14	42,205	345,31	15 72	762,845	166,483	92, 316	16,459	070	8.4	12,779	2,416,488	514,182	514,182 450,410	91.678.403
liornis	Private	857,97	4 175.5	581 1.0	33,555	624	787	99,768	201,78	37 48.	,674,670	3,555 624,787 408,768 201,787 48,674,670 136,122 7	136,139 72,577 7,599,286	7,599	986	3,50	1,572	166,599	548,403	275,936	56,440,55
	State	9,31	2 1,5	911	11,223	5	714	5,509	3,31	0	528,080	215	%	7	1,792		1	,	5.724	4,345	532,872
nosaro	To tal	1.980.138	8 550.8	582 2.53	71.020	1,674	RZR R	56 482	550.42	1211	964, 595	302.830	164.919	64 919 24 263 14R		74. 9.7C	14, 35,1	28.9.7 14.351 2.583.087 1	188	129,691	148, 611, 870



SUMMARY OF ALL RIBES ERADICATION IN THE SUGAR PINE REGION - 1941

TABLE 2

Total Ribes Eradicated		23,517	361,186	384,703	172,190	23,517	533,376	556,893		260,399	410,607	671,006	966,928	799,980	1,810,583	2,610,563	1,227,327	1,210,587	1,810,583	3:021,170		845,161	1,263,949	2,109,110		143,576		3,503,530	1,743,963	1,810,583	7,058,076
Number of 8-Hour Man Days	. Quarantine	267	3,412	3,679	1,715	267	5,127	5,394		2,423	1,347	3,770	8,480	984,4	5,479	9,965	10,903	5,833	5,479	11,312	eo:	5,307	5,055	10,362	Land Administration	1,673		23,165	10,960	5,479	39,604
Acres Worked	Entomology and Plant	263	7,769	8,032	7,228	263	14,997	15,260	Forest Service	3,235	758	3,993	11,353	9,172	10,665	19,837	14,588	9,930	10,665	20,595	National Park Servi	1,563	6,550	8,113	Oregon-California Revested L	5,420	All Agencies	78 <b>8</b> ,384	24 <b>,</b> 927	10,665	63,976
Class of Work	Bureau of	M	Second Working	Total	Second Working	First Working	Second Working	Total		First Working	Second Working	To tal	First Working	Second Working	Third Working	Total	First Working	Second Working	Third Working	Total		First Working	First Working	To ta1		First Working		First Working	Second Working	Third Working	Total
Type of Fund			ERA		Regular		Total Bureau				222			Regular				Total	Forest Service			222	Regular			Regular			Sugar Pine	Region	

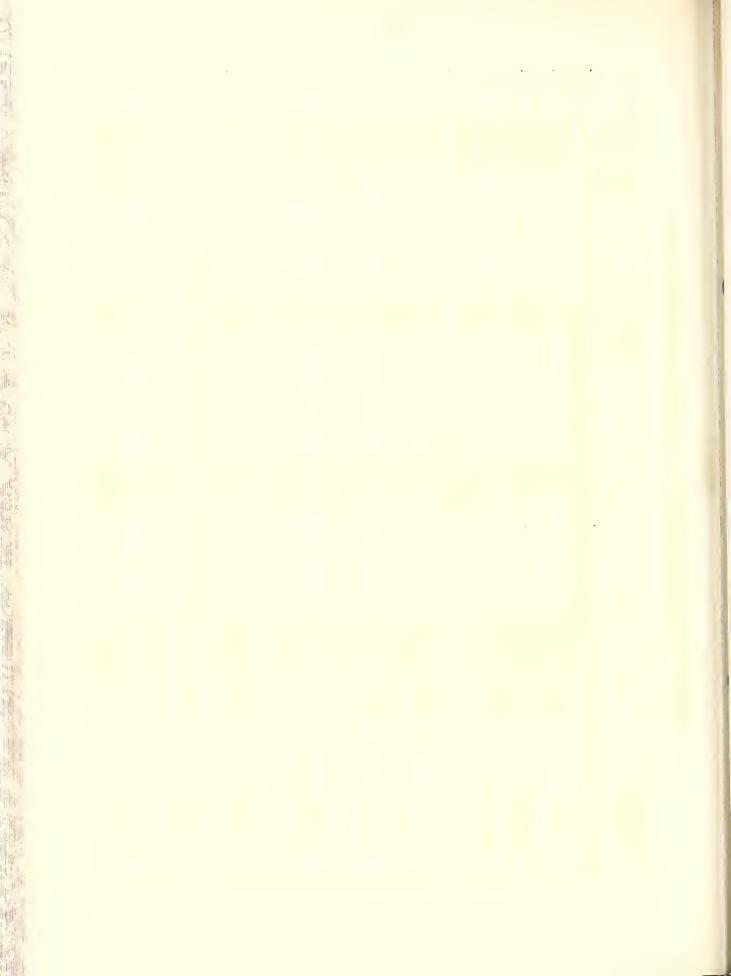
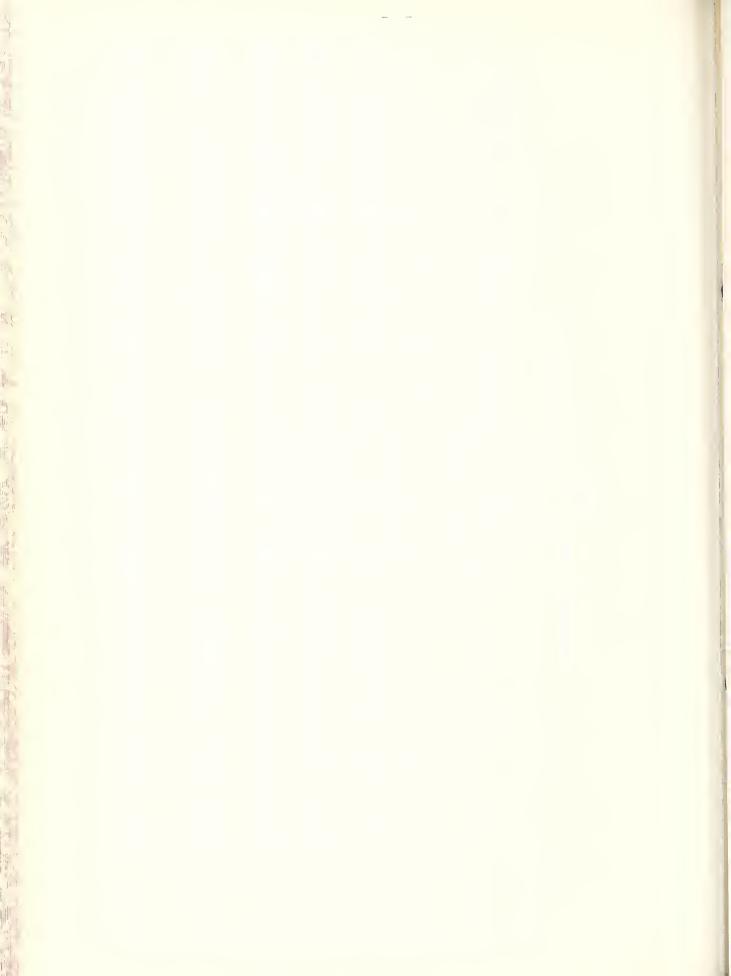


TABLE 3

## SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1941

PART A - Initial Work

							Per Acre	cre									
			Acres				Worked	pe				O	Ownership Status	Status			
	Type					Total	8-Hour		Acres	Acres Covered		mber 8-	Number 8-Hour Man Days	Days	RI	Ribes Bradicated	ted
Agency	of Fund	Worked	Blocked Out	Total	Hen	Eradicated	Men	Ribes	Ribes Federal Private		To tal Fe	Federal Private	rivate	Total	Federal	Private	Total
						M.D.	KLAMATH MATIONAL FOREST	IONAL F	OREST								
Forest Service	Regular	4,120	238	4,358	23,048	208,736	0.70	51	717 3	3,641	4,358	363	2,518	2,881	29,831	178,905	208,736
ļ						PLU	PLUMAS NATIONAL FOREST	ONAL FO	REST								
	202	730	50	780	8,864	133,905	1.52	183			780	1,108	-	1,108	133,905		133,905
Forest Service	Total -	5,952	200	6,882	39,920 48,784	775,213	0.91	108	4,366 1 5,146 1	1,736	6,882	5,016	1,082	066°49	525,243 659,148	116,065	641,308 775,213
						ELDO	ELDORADO NATIONAL FOREST	IONAL F	OREST								
	200	1,260	1,195	2,455	10,520	126,494	1,04	100	2.015	Н	2,455	1,161	154	1,315	108,077	18,417	126,494
Forest Service	Regular	893	1 105	893 7 748	15, 202	116,884	0.68	130	1 2 0 0	893	893	- 1751	600	609	- 000	116,884	116,884
		-1-17	-17	20.00	-7677-	21/11/12	0.0	747		722	20,740	TOTOT	60	1.0 X41	100001	132,301	245,578
					·	NATI	NATIONAL FOREST TOTALS	REST TO	TALS								
	၁၃၁	1,990	1,245	3,235	19,384	260, 399	1,22	131	Ш	Н	Н	니	154	2,423	241,982	18,417	260,399
Forest Service	Total -	12,955	1,633	14,588	87,224	1,227,327	0°77	95	7.878 6	6,270 1 6,710 1	11,353 14,588	6,540	4,209	8,480	797,056	411.854	1,227,327
	000	1 567		1 562	lis liet	alic 161	MATIONAL PARKS	PARKS	1 - (-)	-		-0: 0	-	1	100		1
Yosemite Mational Park	Regular Total -	6,310	240 240	6,550	10,110	2,109,110	0.80	288	6.550 8,113		6.550 8,113	10, 20, 30, 30, 30, 30, 30, 30, 30, 30, 30, 3		10,362	5, 307 845, 161 5, 055 1, 263, 949 10, 362 2, 109, 110		1.261.949 2.109.110
						0	CALIFORNIA TOTALS	LA TOTA	S								
711	၁၁၁	3,553	1,245	4,798	61,840	1,105,560	2,18	-	$\perp$	Η'	14,798	LJ	154	7,730 1	7,730 1,087,143	П	1,105,560
Agencies	Total -	20,828	1.873	22.701	170,120	3.336.437	1.02	160	15,991 6	6,270	17,903	16 902	4,209	13,53511	13,535 1,819,023	411.854	2.230.877
					1	7. 426747		┨	4	1	-1	_}	2026	21102022	0010000	٦	7,570,047/

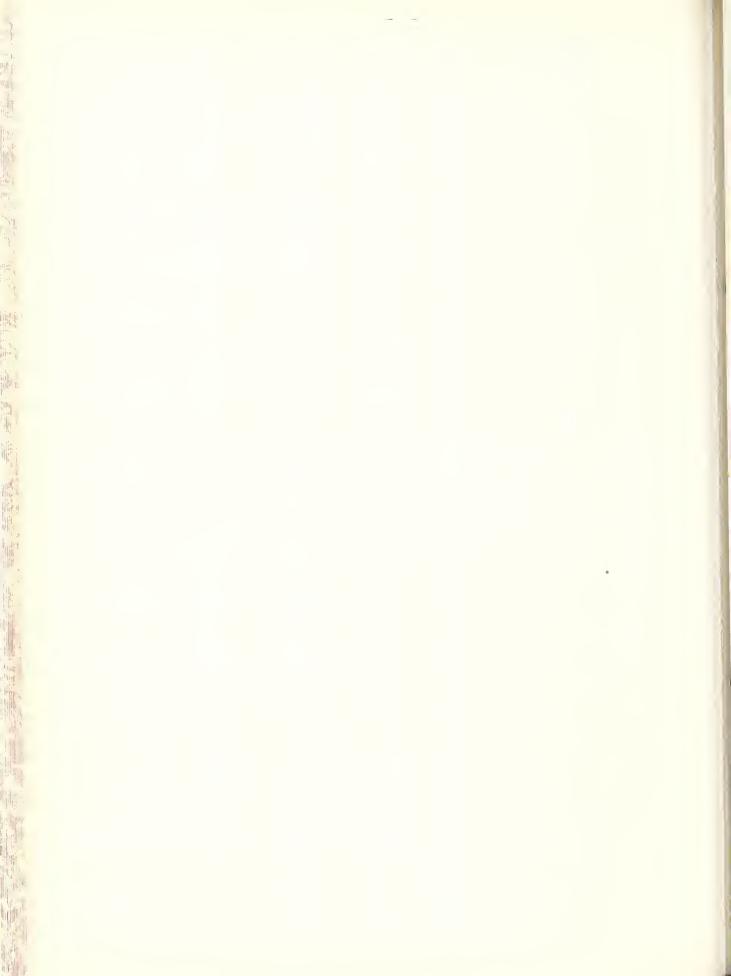


### TABLE 3 (CONTINUED)

## SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1941

## PART B - Reeradication

						Per Acre Basis	e B				OWE	Ownership Status	tatus				Acresge N hearfree
	Type	Class		;	Total	R-Hour		Acre	Acres Covered		Number 8	Number 8-Hour Man Days	n Days	BIL	Ribes Eradicated	ted	at time of
Agency	Fund	of Work	Morked	Hours	Ribes Eradicated	Man	Ribes	Ribes Federal Private	rivate	Total	Federal	Federal Private	Total	Federal	Private	Total	Re- eradication
						PLUM	AS NATI	PLUMAS NATIONAL FOREST	EST								
Forest Service	Regular	Second Working	2,028	6,192	57,682	0.38	28	438	1,590	2,028	167	209	η// /	12,459	45,223	57,682	342
	г					KLDOR	ADO NAT	ELDORADO NATIONAL FOREST	REST								
Forest Service	$\overline{}$	Regular Second Working	2,590	12,736	216,584	0.61	+	+	1,490	2,590	415	1,177	1,592	38,679	177,905	216,584	280
Forest Summary	ary	Total	6,308	26,624	427,645	0.53	68	2,106	4,202	5,718	1,069	2,259	3,328	123,333	304,312	211,061	185
						STANISLAUS		NATIONAL F	POREST								
Forest Service	Regular	Regular Third Working	5,953	18,624	814,336	0.39		▃	-	5,953	2,328	1	2,328	814,336	-	814.336	1.695
	ERA	Second Working	3,437	10,464	76,059	0.38	22	+	2,765	3,437	181	1,127	1,308	6,723	69,336	76,059	170
pareau	Total-	Second Working	10,665	24.184	248.249	0.24	+	1,582	+	7,228	295	1,420	1,715	28,185		21/2,190	870
Forest Summary	1ry	Total	16,618	42,808	1,062,585	0.32	+	+	+-	16,618	2,804	2,547	5,351	849,244	213,341	1.062,585	2,735
						SIER	SIERRA NATIONAL	ONAL FOR	FOREST								
	222	Second Working	758	10,776	410,607	1.78	542	758	-	758	1 7/17		1 2/17	110 607		110 607	
		Second Working	4,554	16,960	525,714	2 m 2 0	Н	3,374	1,220	4,554	1,492	628	2,120	378,681	147.033	525,714	
Forest Service	Regular	Third Working	4,712	25,208	996,247	29°0	Н	Н	80	4,712	2,941	210		980,047	16,200	Ш	
		Total	9,266	42,168	1,521,961	0.57	$\dashv$	$\dashv$	1,300	9,266	4,433	838	_	1,358,728	163,233	1,521,961	1
Forest Summery	Third Working	orking rking	2,512	27,736	936, 321	0.65	176	1,092	1,220	5,312	2 8 3 9	628	3.467	789.288	147,033	936, 321	
	Total-		10.024	52.94	1.932.568	0.66	$^{\dagger}$	+	+-	10.02	5,780	838	5 618 1	760 225	162 222	162 222 1 022 569	-
							1	1	-		2011			56692010	403,633	4 772 900	
						MATIC	NATIONAL FO	FOREST TOTALS	ALS								
	000	Second Working	758	10,776	410,607	1.79	542	+	1	758	1,347	-		410,607	1	109"017	
	Regular	Taird Working	10,665	43,832	1,810,583	0.51		10,585	80	10.665	5.269	21472	5 479 7	1 70h zgz	370.161	799,980	622
Forest Service		Total	19,837	79,720	2,610,563	0.50	H	Н		19,837	7,343	2,622	9,965	2,224,202	386, 361		2.317
	Second Working	orking	9,930	1199 91	1,210,587	0.59	$\dashv$	+	+	9,930	3,421	2,412		840,426	370,161	1,210,587	622
	Third Norking	rking	10,665	43,832	1,810,583	0.51		+	+	10,665	5,269	210	_	.794.383	16,200	1,810,583	1.695
	-	Hite	7 155	20, 450	287 120	222	100	1,678	$^{\dagger}$	2, 155	0,090	2,022		2,634,809	386, 361	3,021,170	2,317
Bureau	llar	Regular Second Working	7,228	13,720	172,190	0.242	+	+	5,646	7.228	295	1,420	1,715	28.185	195, 743	172,120	870
	Total		14,383	38,072	459,310	0.33	Н		Н	14,383	1,130	3,629	4,759	119,562	339,748	459,310	1,225
Summery By	Second Working	orking	24,313	84,736	1,669,897	∄. 0	-	7	7	24,313	4.551	6,041	10,592	959,988	606 602	1,669,897	1.847
Workings	Third Working		10,665	43,832	1,810,583	0.51	7	T	+	10,665	5,269	210	$\neg \tau$	,794,383	16,200	1,810,583	1,695
	Totel	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	34.9/8	128,568	3,480,480	0.40		19,475 11	15,503	¥,978	9,820	6,251	$\neg$	2,754,371	726,109	3,480,480	3,542
Summery	2000 MB		7 1 55	0// 1/0	410,007	100	7 5	+	1 137	1,78	1,54/		1,34	410,607	1 100	410,607	
By By	Regular		27,065	93,440	2,782,753	0.43	忙	Т	10.026	27.065	7.638	1000	1,000	91,5//	520 266	195, 143 281, 120 530 366 5 782 753	187
nung to addy	1 .		34,978	128,568	3,480,480	╌	Т	Т		34,978	9.820	6.251	16.071	16.071 2.754.371	726.109	726,109 3,480,480	3 F122
								1	1						200		



### TABLE 3 (CONTINUED)

### SURMARY OF RIEES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1941

PART C - All Workings

The state of the s

	Туре			Total					wnership				
	of	Acres	Man	Ribes		Acres		Mumber	8-Hour M	n Days	Rth	s Eradicat	ed
Agency	Funds	Worked	Hours	Eradicated	Federal	Private	Total	Federal	Private	Total	Federal	Private	Total
				. K	LAMATH NA	TIONAL I	OREST						
orest Service	Regular	4,358	23,048	208,736	717	3,641	4,358	363	2,518	2,881	29,831	178,905	208,
				P	LUMAS NAT	IONAL FO	REST						
	CCC	780	8,864	133,905	780	-	780	1,108	-	1,108	133,905	-	133,
orest Service	Regular	8,130	46,112	698,990	4,804	3,326	8,130	4,075		5,764	537,702	161,288	698,
	Total -	8,910	54,976	832,895	5,584	3,326	8,910	5,183	1,689	6,872	671,607	161,288	832,
					DORADO NA								
	CCC	2,455	10,520	126,494	2,015	11/10	2,455	1,161	154	1.315	108.077	18,417	126.
orest Service	Regular	3,483	17,608	333,468	1,100	2,383	3,483	415	1.786	2,201	38,679	294.789	333.1
	Total -	5.938	28,128	459.962	3.115	2.823	5.938	1.576		3.516	146.756	313.206	459.
Ureau Total	ERA	3.718 9.656	13.888 42.016	671,061	1.006 4.121	2.712 5.535	3.718 9.656	2,230		1.736 5.252	84.654 231.410	126.407 439.613	671.0
10011 -		9,050	42,010	0/1,023	4,1211	2,2321	9,050	1 < 20	3,022	2,476	231,410	439.0131	0/1.
		5.057	7.0 (0):		MISLAUS N			0 700		0.70%	(3) 37()		an le
orest Service	Regular	5.953	18.624	814.336	5.953	0.765	5.953	2.328	- 1 107	2.328	814.336	(0.77(	814.
	ERA	3,437 7,228	10.464	76.059 172.190	672	2.765 5.646	7.228	181	1,127	1.308	6.723 28.185	69.336 144.005	76.
ureau	Regular Total -	10,665	13.720 24.184	248,249	2.254	8,411	10.665	476	2.547	1.715 3.023	34,908	213.341	248
Motol .	TOTAL -	16,618	42,808	1.062.585	8,207	8.411	16.618			5,351	849,244	213.341	
		20,020	71.1000							78 7 7-	07/12/7	<u> </u>	
	L ccc	758	10,776	410,607	TERRA NAT	- IONAL FC	758	1.347	-	1.347	410,607	- 1	410.
orest Service	Regular	9.266	42.168	1.521.961	7.966	1.300	9.266		838		1.358.728	163,233	
	Total -	10.024	52,944	1,932,568	8,724	1,300	10,024	5,780	838	6.618	1.769.335	163,233	1.932.
				w	ATIONAL F	ሳስውም ፍም መሰ	P.T.ATV						
	CCC	3,993	30,160	671,006	3,553	140	3,993	3,616	154	3,770	652,589	18,417	671.
orest Service	Regular	31,190	147,560	3,577,491	20.540	10,650	31,190		6.831		2,779,276	798,215	
	Total -	35,183	177,720	4,248,497	24,093	11,090	35,183	15,230	6,985		3,431,865	816,632	
	ERA	7,155	24,352	287,120	1,678	5,477	7,155	835	2,209	3.044	91,377	195.743	287.
ureau	Regular	7,228	13,720	172,190	1,582	5,646	7,228	295	1,420	1.715	28.185	144.005	172.
	Total -	14,383	38,072	459,310	3,260	11,123	14.383	1,130	3,629	4.759	119,562	339.748	459.
Total -		49,566	215,792	4,707,807	27.353	22,213	49,566	16,360	10,614	26,974	3,551,427	1,156,380	4.707.
						NAL PARE							
Yosemi te	CCC	1,563	42,456	845,161	1,563	-	1,563	5,307	-	5,307	845,161	_	845.
Mational Park	Regular	6.550	40.440	1,263,949	6,550	-	6,550		-		1,263,949	-	1.263.
Mattonar sure	Total -	8,113	82,896	2,109,110	8,113	-	8,113	10,362		10,362	2,109,110	-	2,109,
						NIA TOTA							
	CCC	5,556	72,616	1,516,167	5,116	hhО	5,556		154		1,497,750	18,417	
	ERA	7,155	24,352	287,120	1,678	5.477	7,155	835	2,209	3,044	91.377	195.743	287.
All							33 20-		-		D 1		
All Agencies	Regular Total -	44,968 57,679	201,720	5,013,630	28,672	16,296	44,968 57,679	16,964			4,071,410 5,660,537	942,220	5,013,

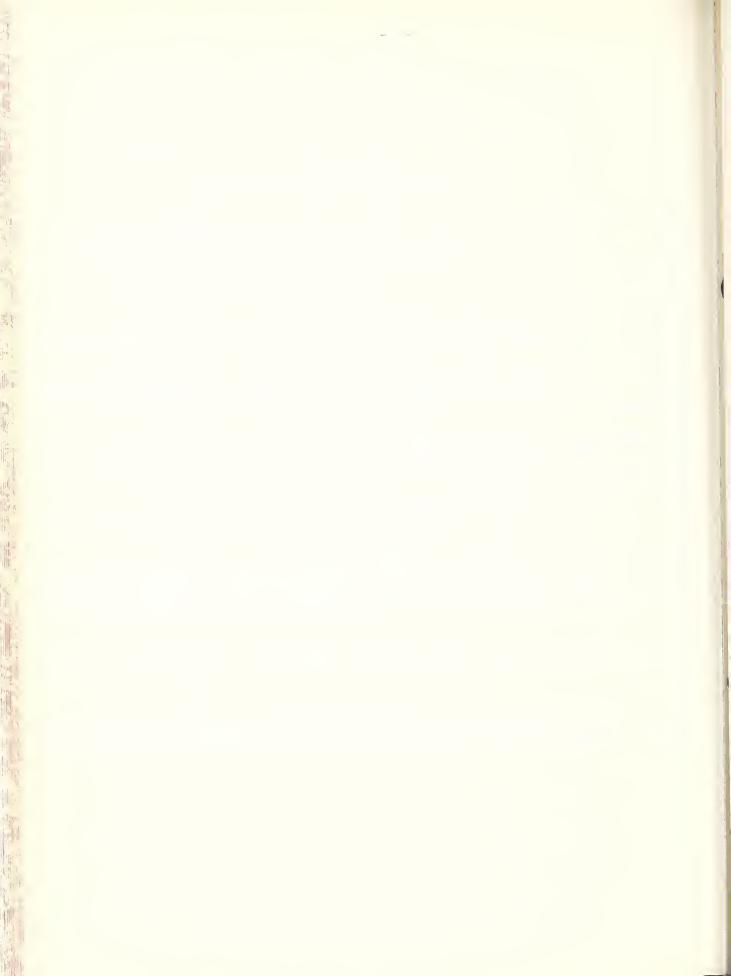


TABLE 4

SUMMARY OF RIBES ERADICATION FOR ORECON - 1941

		₽	Acres				Per Wo	Fer Acre							Ownership Status	Status							Acres
										Acre	Acres Covered	ď		×	umber 8-	Number 8-Hour Man Days	Days			Ribes Eradicated	adicated		Ribes-free
Class	9.8					Total	8-Hour	1-	. 7	Faderal					Faderal				F.	Federal	_	<u></u>	at Time of
Work		Worked	Blocked	Total	Man Hours E	Eradicated Days	Men	Вірев	Ribes Forest	0 % 0	Total	Total Private Total	Total	Mational Forest	0 %	Total	Private	Total	Forest	-	Total Private	te Total	Re- eradication
										SISKIY	SISKIYOU NATIONAL FOREST	MAL FORE	T.S.										
Firet Working	1ng	263	1	263	2,136	23,517	1,02	68				263	263				267	267			27 517	7 23 617	
Regular Working	1ng	2,135	3,285	5,420 13,064	3,064	143.576	92.0	49	1,510	3,134 4,644	4,644	776	776 5,420	368	1,074 1,442	1,442		1.633	17.693 1	14, 239 131	1.633 17.693 1114,239 131,932 11,644 143,576	143,57	
1		2,398	, 285	3,285 5,683 15,200		167,093 0.79	0.79	70	1,510	3,134 4,644 1,039 5,683	η <sup>1</sup> Θ,μ	1,039	5,683	368	1,074 1,442	1,442	458	1,900	17.693 1	4.239 131	1,900 17,693 114,239 131,932 35,161 167,093	61 167,091	ī
										ROGUE R	ROGUE RIVER NATIONAL FOREST	IONAL FO	HEST										
Second	y <sub>a</sub>	419		ήT9	2,944	74°066	0,60	121				419	614				368	368			λη, οί	990,47 990,45	
											TOTALS	w											
First	99	2, 398 3	3,285	5,683 15,200	2,200	167,093	0.79	70	1,510	3,134	ग लाग	1.039	5,683	368	1,074	1,442	458	1,900	17,693 17	4,239 131	1,900 17,691 114,239 131,932 35,161 167,093	51 167.093	1
Working	9a	419		419	2,944	990.47	0,60	121				614	419				368	368			74.06	990.47 990.47	1
1 1 1	1	3,012	3,285	6,297 18,144	3,144	241,159	0.75	80	1.510	3.17th h.6hh 1.653	1, 644	1.653	6.207	268	1 074 1 1412	्राम् ।	960	296 0	2 603	25 12 60 11 10 10 10 10 10 10 10 10 10 10 10 10		7	



-35-

TABLE 5

THE DISTRIBUTION OF CAMPS BY OPERATION AND COUNTY IN THE SUGAR PINE REGION DURING 1941

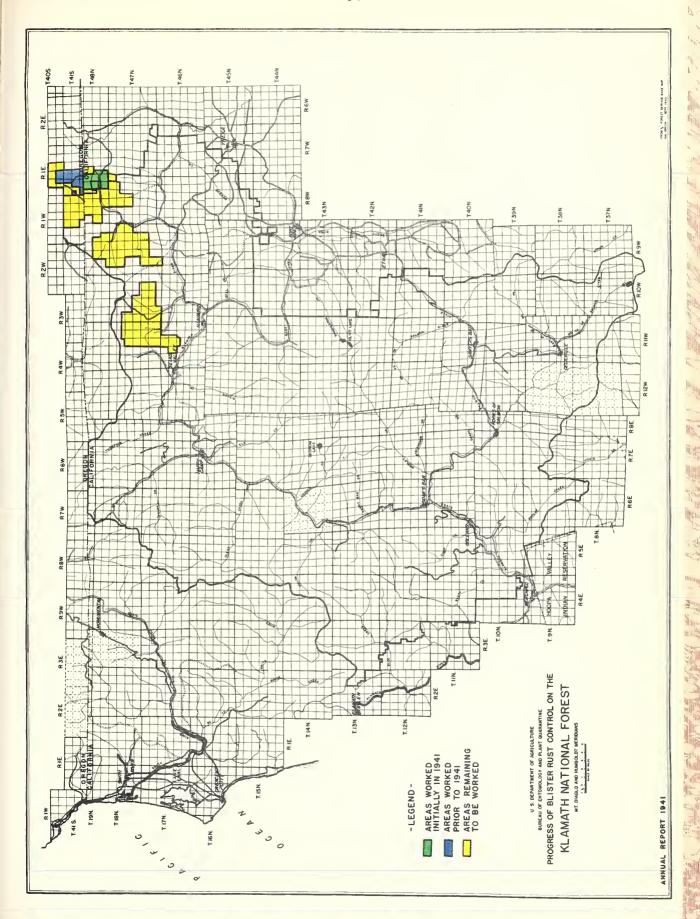
Agen	Agency		Number and	Approximate Period	
		County	of Camps	Operation	Location
			OREGON		
- ERA		Josephine	1-30 Man	May 1 - June 30	Swede Basin
O&C-Reg. Jo		Josephine	2-33 Man	July 20 - Oct. 10	Swede Basin & Bunker Hill Mine
ec - era Ki	K1 Ja	Klamath & Jackson	1-15 Man	Sept. 8 - Oct. 20	Pinehurst
			CALIFORNIA		
FS - Reg. Sie		Siskiyou	1-80 Man	June 15 - Oct. 20	Hungry Creek
222 -		Plumas	1-50 Man	- Sept.	Granite Basin
		Plumas	2-33 Man	- Sept	Cold Water & Estray Creeks
		te	1–33 Man	1	Big Bar Mountain
		Eldorado	1-50 Man	April 1 - Aug. 15	Mosquito and Caldor
- Reg	Ата	dor	· 1-33 Man	1	Matson Will .
- ERA	Eld	Eldorado	2-70 Man	1	Ice House & Jones
وه البر ا	Tho	Tuolumne	1-33 Man	ı	Bumble Bee
- ERA	Tuo	Tuolumne	1-70 Man	May 1 - June 30	
- Reg.	777	Tuolumne	1-33 Man		Beaver Creek
	S	Calaveras	1-33 Man	5 -	Hayward Creek
222 -	M.	Mariposa	1-50 Man	1	Soquel
FS - Reg. Ma	Ma EM	Mariposa	2-33 Man	1	Signal Peak & Summit
NPS - CCC Tu	7.	Tuolumne	1-40 &1-50 Man	May 15 - Aug. 20	Middle Fork & Crane Flat
202 -	ES.	Mariposa	1-40 Man	April 17- July 18	Mawona
NPS - Reg. Ma		Mariposa	1-33 & 1-66 Man	July 20 - Oct. 18	Tamarack Flat & Yosemite Valley

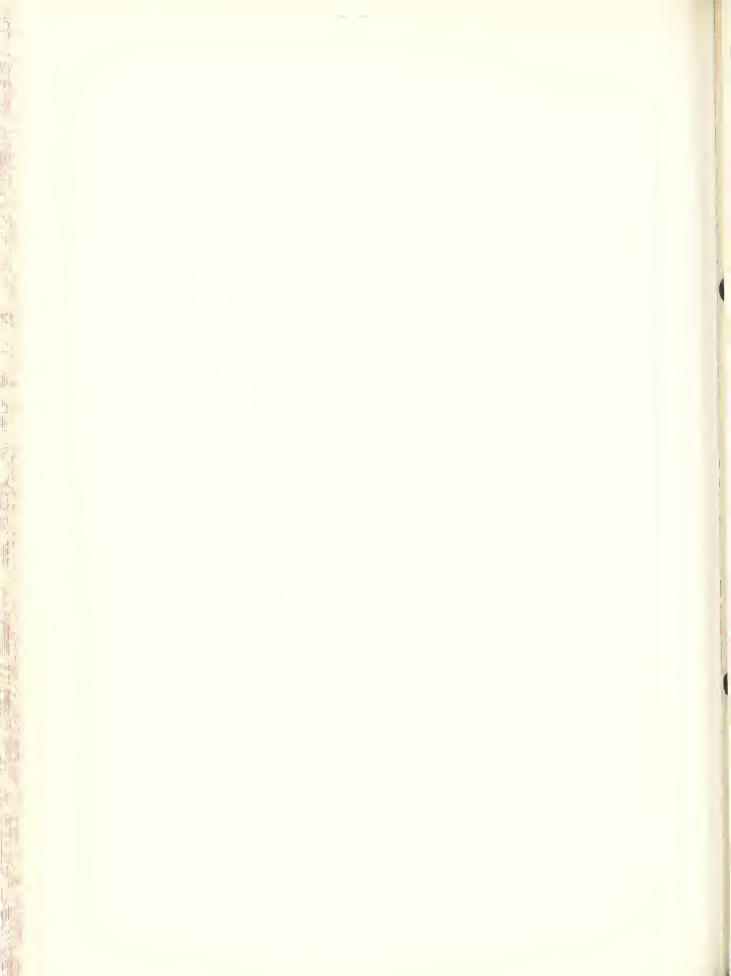
TABLE 6

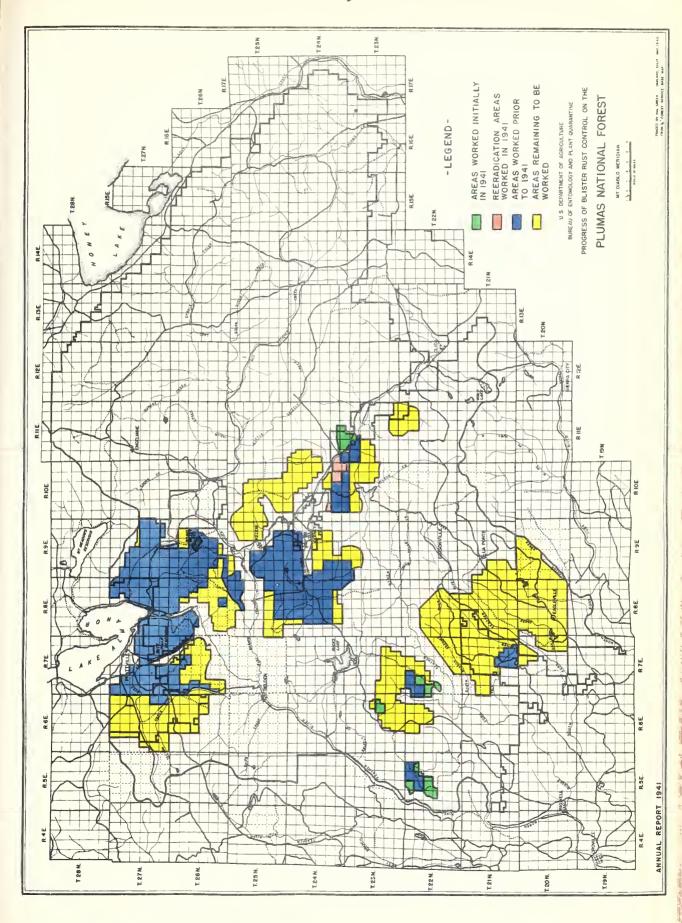
### ADJUSTED STATEMENT OF COST OF RIBES ERADICATION FOR THE SUGAR PINE REGION - 1941

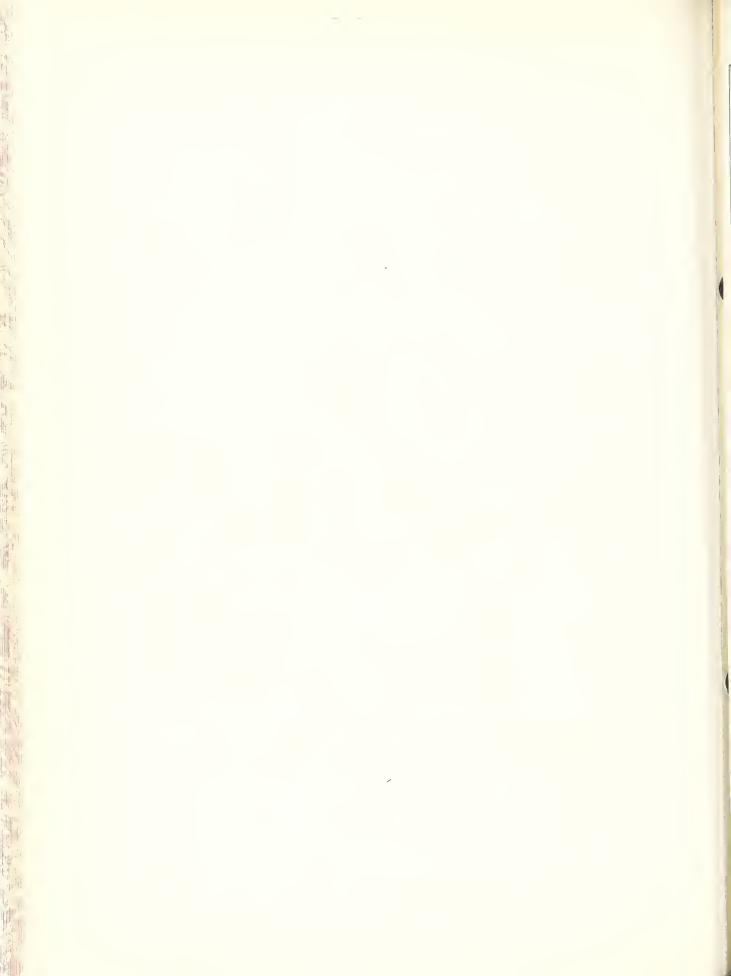
### (Bureau Only)

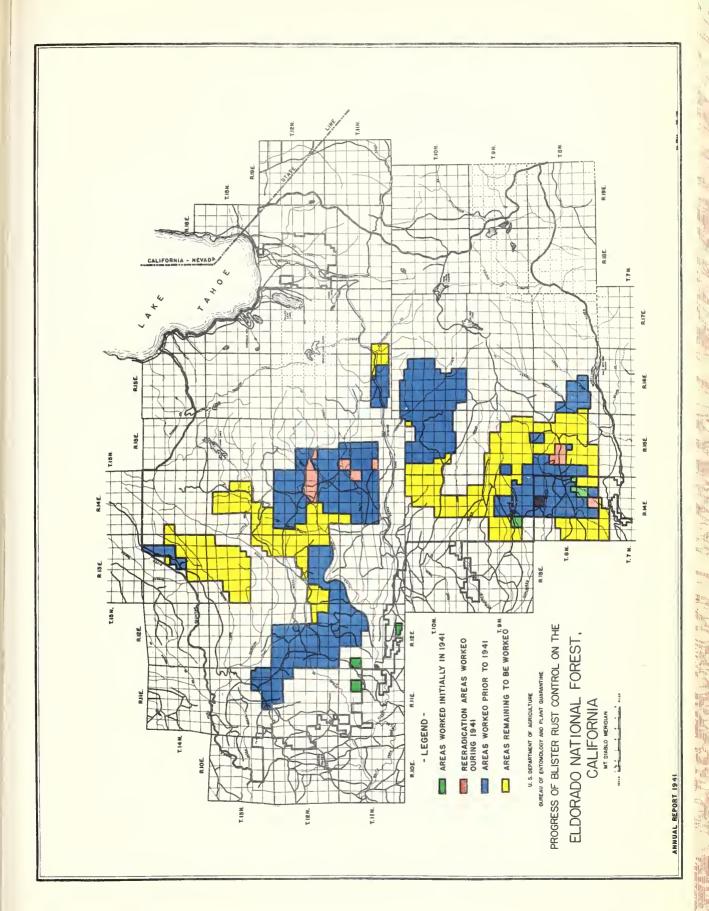
Classification of Expenditure	Eldorado Operation	Stanislaus Operation	Oregon Operation
Wages - Temporary employees	\$ 8,414	\$ 15,652	\$ 4,665
Subsistence supplies	4,507	5 <b>,</b> 652	552
Other Supplies and Expenses	489	763	137
Transportation and Travel	660	753	794
Gross Distributed Expenses -	14,070	22,820	6,148
Plus Depreciation on Equipment	2,875	2,875	2,875
Total Eradication Charges	\$ 16,945	\$ 25,695	\$ 9 <b>,</b> 023
Number of Effective Man Days	1,736	3,023	635
Cost Per Effective Man Day	\$15.66	\$8 <b>.</b> 50	\$14.21



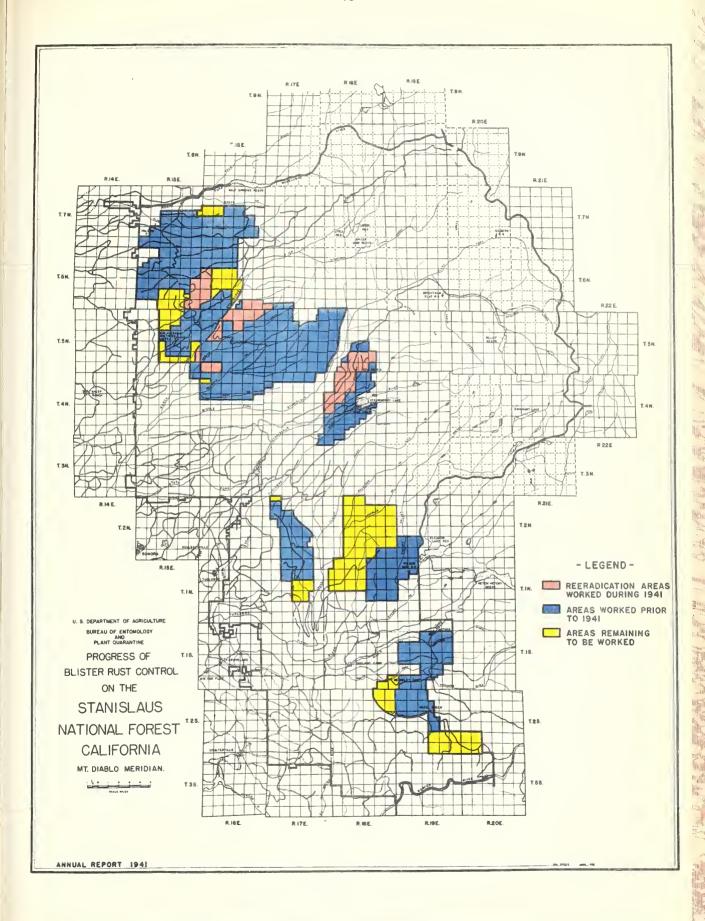


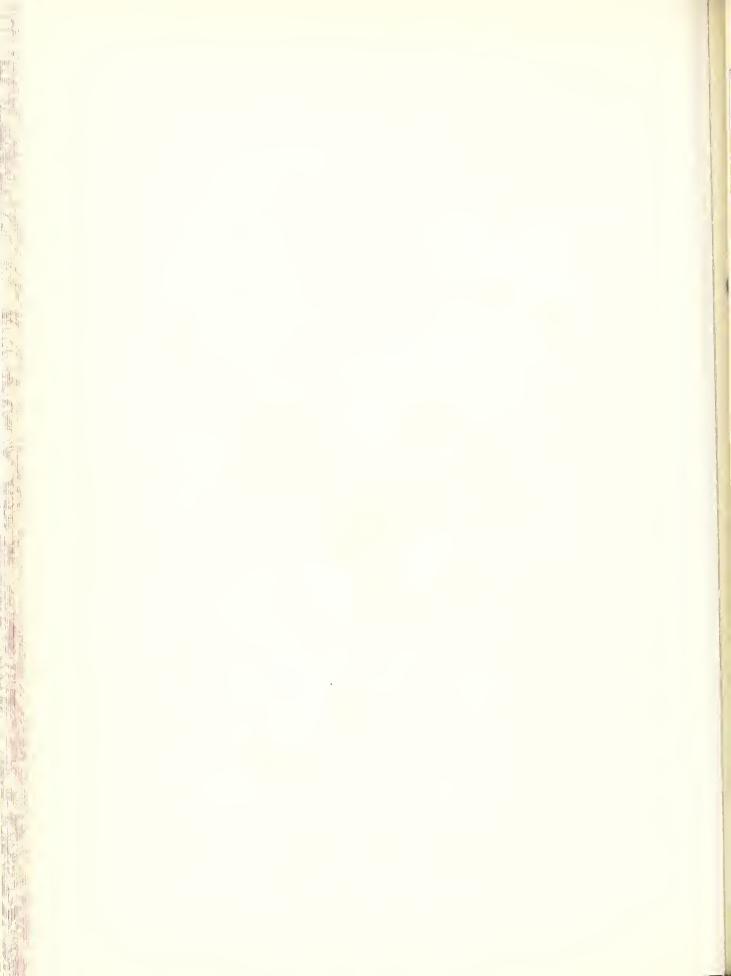


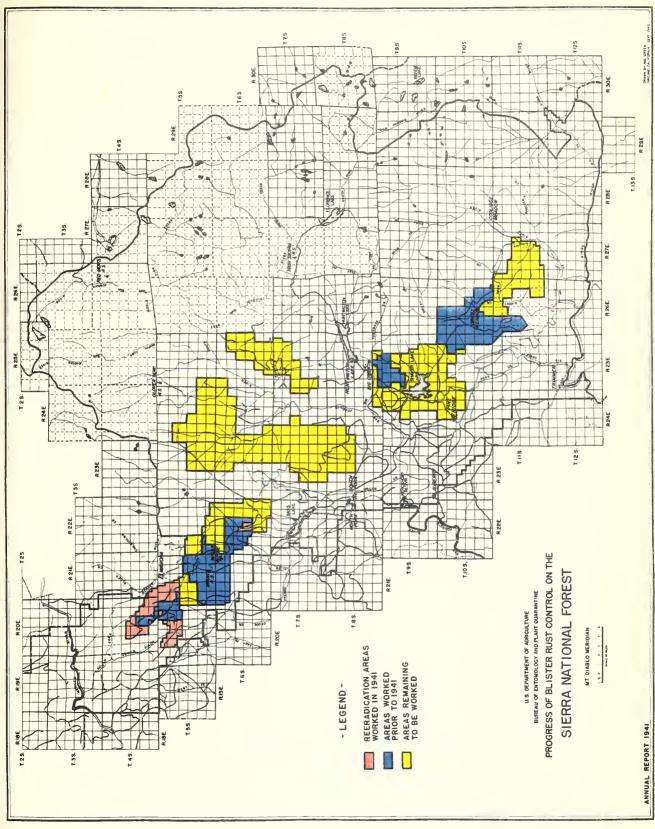


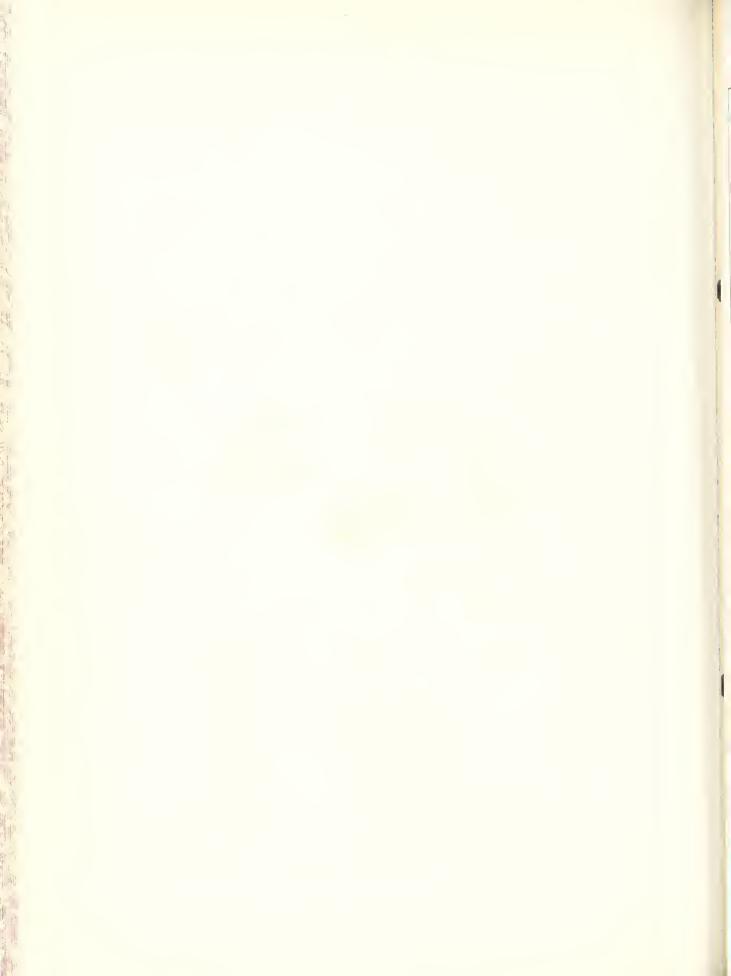


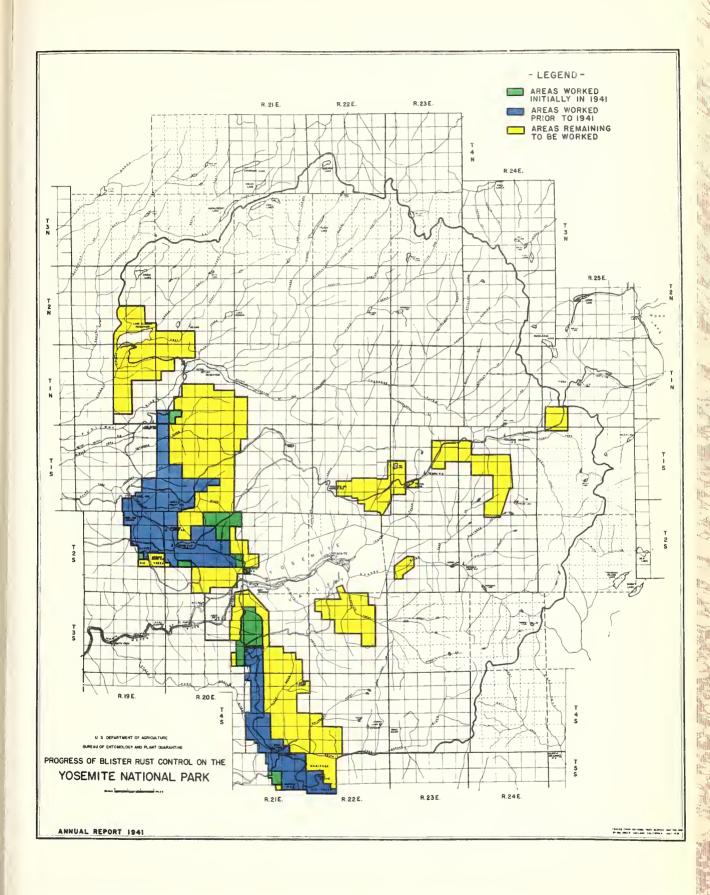


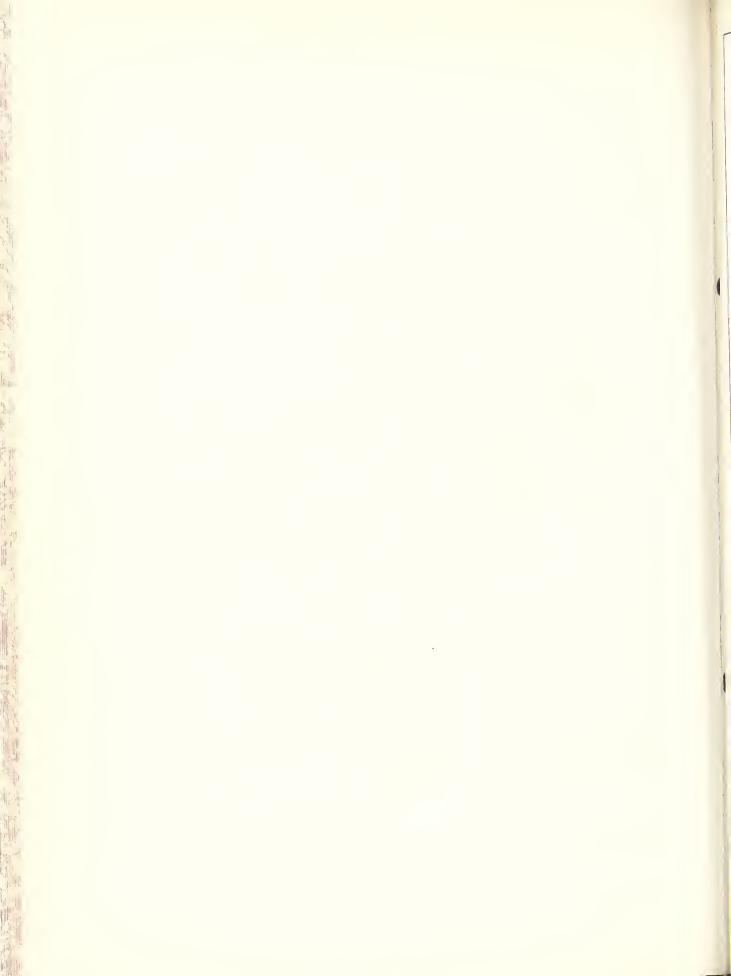


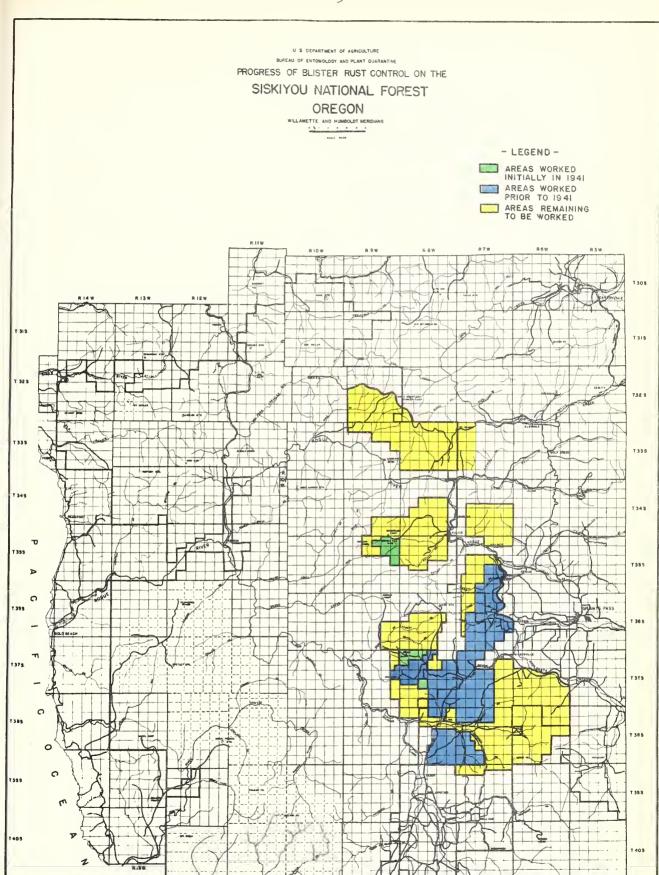




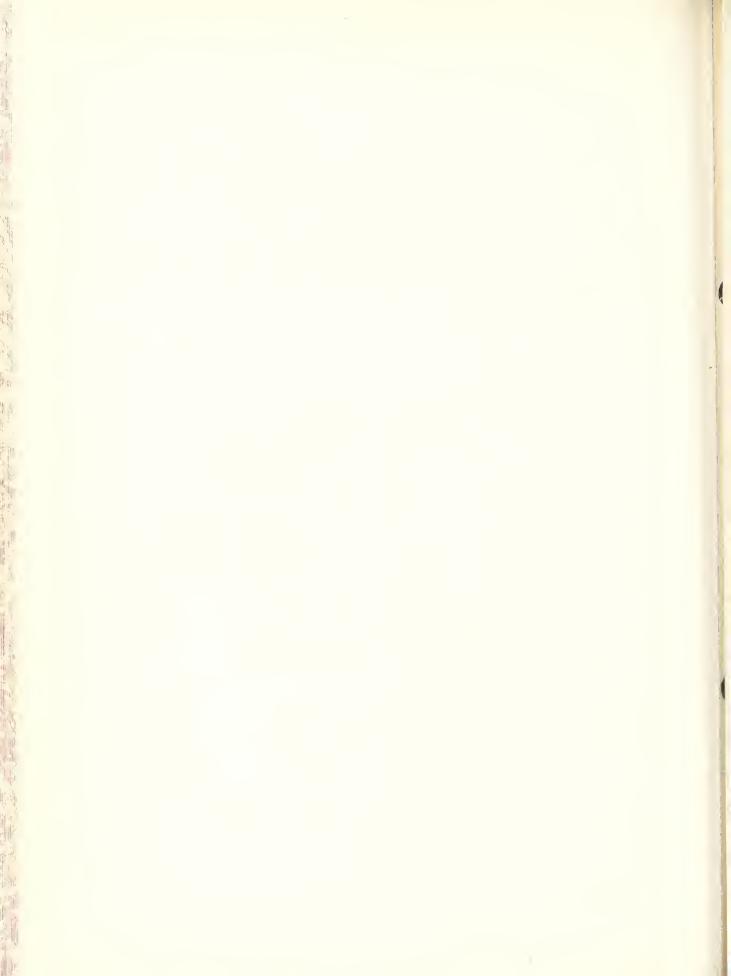








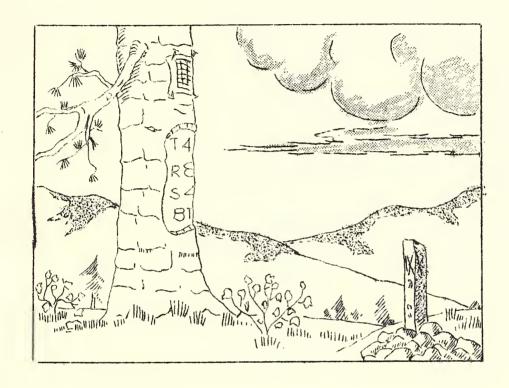
ANNUAL REPORT 1942



#### PART IV - CHECKING

Ву

Lyle N. Anderson and S. Daryl Adams, Agents



During the 1941 field season regular, advance, or post checks were conducted on all operations within the Sugar Pine Region. Several departures were made from standard practices, as on the Siskiyou National Forest where additional information on sugar pine and associated tree species was requested by the Oregon and California Revested Lands Administration. On the Stanislaus National Forest a checking experiment was conducted by means of a 100 per cent check on a 40-acre block to analyze the reliability of checks and to promote the best interpretation of checking results. On the Sierra National Forest and Yosemite National Park a new and amplified method of taking Ribes data on post check areas was instituted with very satisfactory results.

## ORGANIZATION AND ADMINISTRATION

The general organization of the checking personnel remained unchanged from that of previous years. The Bureau's regional checking supervisor, assisted by five full-time checking supervisors, was responsible for all checking work and the direction of checkers assigned to the four cooperating agencies: the U. S. Forest Service, the O and C Administration, the National Park Service, and the Bureau of Entomology and Plant Quarantine.

The same plan of salary reimbursements for checkers working on the lands of cooperators was used between the cooperating agencies and the Bureau as was adopted in 1940, except that for the work on the Umpqua National Forest the Forest Service by agreement employed the personnel and paid their salaries directly. On the other projects the Bureau was the employing agency, paid all salaries, and was reimbursed by the cooperating agencies. In this way checkers could be moved between camps regardless of agency, contingent on the needs of the various jobs.

The five full-time checking supervisors were assigned as follows:

Klamath National Forest and
Oregon Operations ...... Lyle N. Anderson,
Agent

Plumas National Forest ...... S. Daryl Adams, Agent

Eldorado and Stanislaus

National Forests ...... Carl W. Fowler,

Assistant Forester
Assisted by Glenn J. Taylor,

Agent

Sierra National Forest, Yosemite National Park, Kings Canyon

National Park ...... John N. Mitchell,
Assistant Forester

There were 44 checkers employed in the Sugar Pine Region to conduct the various field assignments. Included in this total were one checker foreman, two junior checker foremen, 13 senior checkers, and 28 junior checkers. The wage rates remained the same as those in force for several years. It is now likely that present wage rates may have to be increased as an inducement for the return of experienced personnel and to secure a better selection from the few sources of labor remaining available. The wage rates now in effect are noticeably below the current trend in wages for comparable work.

## Checking Methods

Checking methods for 1941 underwent little change in actual practice and in methods of conducting the several checks. However, in some instances additional information was needed for a complete appraisal of particular areas. Mention of some of these was made briefly earlier in this report, and complete accounts and the results are now being prepared. Worthy of brief mention was the practice in use on the Klamath National Forest wherein all Ribes found on the check strips were examined for infection. Diseased bushes were recorded and plotted on the map separately so that the eradication forces would have a clear picture of the location and extent of all rust centers.

In connection with the advance check of the Soldier Creek area of the Siskiyou National Forest a second man accompanied the checker in order to record timber data. In the beginning only sugar pine by four size classes

was counted. Trees under six feet high were counted on one-tenth acre circular plots taken at 10-chain intervals beginning at 5-chains from the start of the strip. The other three size classes were on a diameter basis and were counted on a continuous strip. The method later put into use at the request of the 0 and C Administration was to count all commercial tree species by five diameter classes on one-fifth and one-tenth acre plots spaced every 10 chains along the check strip. All trees under a three inch diameter were counted on the one-tenth acre plot and the other four size classes, namely, 4-7, 8-15, 16-23, and over 24 inch diameters, were counted on a one-fifth acre plot. Increment borings and height measurements of sugar pine were made occasionally so that site quality determinations could be made for the area.

In conjunction with the second post check of the Wind River Mursery on the Columbia National Forest, a flanker system of combined checking and Ribes removal was used to cover a 160 acre area around the nursery and arboretum. By this method the checker ran the standard check strips 2-1/2 chains apart while the other two men covered a strip about a chain wide on each side of the checker. By this means an average of 35 acres a day was covered and a total of 18 Ribes bushes removed from the 160 acres.

The post checking method previously in use was expanded to include the inspection of all Ribes bushes on the checker's strip to determine, (1) if the bushes were missed by the previous eradication, (2) bushes found by sprouting of cut-off crowns on imperfectly eradicated plants, and (3) new bushes that became established since the last eradication. This information is intended to give considerable light on the thoroughness of previous eradications, the amount of Ribes regeneration on those areas, and some insight into the effectiveness of previous checking practices.

## CHECKING FIELD ACTIVITIES

## California

During 1941 there was a surplus of 15 sections of advance checking built up on the Plumas National Forest on which future eradication work plans can be made. There was a very small amount of worked acreage left unchecked although only eight checkers were employed this season.

The Eldorado and Stanislaus National Forests were handled as one operation with 14 checkers employed. On the Eldorado Forest the Gilmore Experimental Area of 400 acres including the protective strip was checked for the first time.

Four checkers were employed in Yosemite National Park. At the start of the regular funds program in July these men were used to supervise eradication crews until adequate regular supervision was available. There is now an advance check reserve of 25,000 acres and a post check reserve of 5,000 acres.

Five checkers were employed on the Sierra National Forest. In addition to the regular checking they covered 31,400 acres of post check by the new amplified system, thereby giving a representation of essentially all conditions to be expected in reeradication in the localities examined.

On the Klamath National Forest a complete system of controls was surveyed to correct deficiencies of the original Public Survey, and from the information gained, a new set of maps was made of the area. There was a large amount of unchecked acreage since considerable area was worked late in the season in order to remove the heaviest rust centers. Because of defoliation of the Ribes it was considered advisable to wait until next season before checking these areas.

## Oregon

On the Siskiyou National Forest it was necessary to conduct considerable checking from special checking camps, one of them being a pack camp. The Forest Service furnished the packing at no charge. There was considerable time spent in moving and building camps, making pine counts, and running out section lines.

The Umpqua National Forest party was composed of a chief of party who was responsible for the timber survey, a checker foreman who was in charge of the checking, three 2-man timber survey crews, 3 checkers, and a cook, making a total of 12 men. A checker accompanied each timber survey crew. As the eight strips per section were run with a staff compass and chain, the checker was able to dispense with the mechanics of strip running and spend all his time searching for Ribes and counting sugar pine. He took data by circular plots for the minimum, or 6 foot, height class of sugar pine. All other data for sugar pine and associate species were taken by the timber survey party. Other information gathered was the basis for the preparation of a ground cover map, timber type map, cultural features map, and a topographic map. Only a 2-1/2 per cent check was made of the area, and it will be necessary to complete the 5% check before much eradication can be done. It is felt that hy combining the two types of work no sacrifice of efficiency or objectives was made by either organization. Very accurate data resulted from the full understanding of respective duties had by each party and from the complete accord in which they worked.

The Wind River Nursery and protective zone of 1,440 acres received eradication work in 1930, 1931, and 1939. A post check in 1939 showed 244 acres requiring eradication work. The 1941 post check show d the area requiring eradication to have decreased to 43 acres.

The O and C McKinley Mursery near Coquille, Oregon, of 297 acres including the protective zone was given an advance check.

#### EXPLANATION OF TABLES

The results of all classes of checking are presented in Table 1 to 4 inclusive. Tables 1 and 4 give a summary of regular checking results, Table 2 gives a summary of advance and post checking results, and Table 3 presents an analysis of checking cost and production.

Table 1 - In the column headed "Acres Covered" are shown all acres on which a first regular check was conducted, but each acre is included only once. The acreage of a tract receiving a first check but not a final check is included; by contrast, in this table in previous reports only the acreage receiving a final check appears in this column. The total for the Sugar Pine Region includes 6,031 acres claimed by eradication in 1940 and 356 acres covered by a checking experiment conducted on the Eldorado-Stanislaus operation. On the Klamath operation 967 acres were worked and checked in 1940 but not claimed by eradication until 1941. Under "Acres Unchecked" appear the acres on which Ribes eradication work was performed, but on which no first regular check was made.

The "Percent of Check" was determined by dividing the acres in check strips by the acres covered by check.

Under "Man Days" are included all man days actually spent running check strips and proportional amounts of training, travel, office, control, and checker foreman time. The total number of man days spent on training, travel, office and supervision (checker foreman) was prorated to the three classes of checking in proportion to the number of actual field man days spent on each. Control time was prorated to the three classes of checking and to "Pine Counting" and "Eradication." The time of the checking supervisors, annual leave, sick leave and off duty time of the checkers is not included in this report.

Table 2 - The columns headed "Acres Covered" present the total number of acres to which the sample check applies. Whenever a check less than five percent was sufficient to establish the population classes, all acres in the section were claimed. "Man Days" includes all time spent running strips and proportional amounts of training, travel, office, control, and checker foreman time.

Table 3 - In the column headed "Effective Man Days" the figures for all classes of checking were obtained from Tables 1 and 2. The man days for "Fire," "Eradication," and "Pine Counting" were taken from the checkers time summaries with prorated amounts of control time added to the latter two: activities. "Strip Acres" included the total acreage of all check strips. For regular checking this includes all first sheek strip acres and recheck strip acres. "Strip Acres per Checker Man Day" were computed on the basis of total man days exclusive of checker foreman time. "Strip Acres per Checker Field Man Day" were computed on the basis of man days actually spent on check strips. The "Total Cost" for each operation includes the gross salaries or all checkers and checker foremen and the cost of operating all pickups (at a cost of four cents per mile) that were used on checking. The Oregon cost figure includes \$360.78 which was spent to employ cooks for the advance checking and pine counting parties on the Siskiyou and Umpqua National Forests. The cost of each activity was determined by computing the cost per effective

man day for each operation and applying this figure to the number of man days spent on each activity. The "Cost per Acre Basis of Acres Covered by Check" was computed from the cost figure in the preceding column and the acreage figures in Tables 1 and 2.

Table 4 - The "Man Days" and "Total Cost" under "All Regular Checks" were obtained from Table 3. The acreage for first check was taken from Table 1. The "Total Cost" for first check and rechecks was determined by multiplying the number of man days spent on each by the cost per effective man day.

TABLE 1
SUMMARY OF REGULAR CHECKING IN THE SUGAR PINE REGION - 1941

Operation	Acres Covered	Acres Unchecked	Percent of Check	Man Days
Oregon	2,636	893	5.1	74-4/8
Klamath National Forest	2,431	722	5.2	75-1/8
Plumas National Forest	8,547	163	5.1	259-3/8
Eldorado-Stanislaus National Forests	26,057	3,722	4.7	655-6/8
Sierra National Forest	10,062	282	4.5	213-2/8
Yosemite National Park	6,516	1,693	3.8	139-3/8
Kings Canyon National Park	514	0	2,6	11
California Totals	54,127	6,582	4.6	1,353-7/8
Sugar Pine Region	56,763	7,475	4.6	1,428-3/8

TABLE 2

SUMMARY OF ADVANCE AND POST CHECKING IN THE SUGAR PINE REGION - 1941

	Adv	Advance Check	u		Post Check	
	4 0 1	Percent	r gN	A 0 4 0 0	Percent	Men
Operation	Covered	Check	Days	Covered	Check	Days
Oregon	22,632	3.4	372-5/8	1,440	5.5	56
Klamath						
National Forest	3,508	3.3	57	1	-	1
Plumas National Forest	15,901	2.8	250	ı	ı	1
Eldoredo-Stanislaus			\			
National Forests	6,775	2.8	59-5/8	10,309	3.5	121-7/8
Sierra					n:	
Mational Forest	1	ı	1	31,394	7.1	216-2/8
Yosemite						
National Park	7,333	3.2	8/2-66	5,289	3.0	68-2/8
Kings Canyon						
National Park	I		1	607	2.4	8-5/8
California Totals	53,517	3.4	465-7/8	47,599	2.1	415
Sugar Pine						
Region	56,149	3.4	838-4/8	49,039	2.2	1441
in the second se						

TABLE 3

ANALYSIS OF CHECKING COST AND PRODUCTION IN THE SUGAR PINE REGION - 1941

Cost	Per	Strip Acre	\$3.09	3.20	2.10	3.10	1		ı	2.63	3.03	1	1	1	1	3.47	2.73	,	1	1
Cost Per Acre Basis	£.	Acres Covered By Check	-		.116	-117	1	•	ı	.191	.101		1	1		.198	.102		1	1
		Total	\$ 478.08	2,481.20	166.85	3,126,13	233.43	305.62	3,665,18	89* 191	352-57	64.99	9.28	18.56	911.58	1,689.51	1,628.45	147.38	299.64	3,764.98
Strip Acres Per	Checker	Field Man Day	3.1	3.1	9.4	3.2	ı	_	1	2.9	2.5	ı	ı	1	1	2.2	رن ∞•	1	1	1
Strip	Per	Checker Man Day	2.3	2.3	3.4	2.3	1	ı	ı	2.4	٥ <b>.</b> د	1	1	1	ı	1.9	2,4	ı	ì	1
		Acres	154.8	775.2	79.6	1,009.6	1	t	1	176.4	116.2	1	1	-	292.6	8*984	596-5	ı	1	1,083.3
ctive Days	Percent	oi Total	13.4	6.99	1.1	85.0	6.5	8.5	100.0	51.0	38.7	7.3	1,0	2.0	100.0	6.44	43.3	3.9	_	100.0
Effective Man Days		Number	8/11-11/8	2-5/	56	473-1/8	36-3/8	47-5/8	557-1/8	75-1/8	52	10-6/8	1-4/8	3	147-3/8	259-3/8	250	22-5/8	94	578
		Activity	Regular Checking	Advance Checking	Post Checking	All Checking	Eradication	Pine Counting	Total	Regular Checking	Advance Checking	Eradication	Pine Counting	Fire	Total	Regular Checking	Advance Checking	Pine Counting	Fire	Total
		Operation			Oregon							Klamath	National Forest				Plumas	National Forest		

TABLE 3 (CONTINUED)

ANALYSIS OF CHECKING COST AND PRODUCTION IN THE SUGAR PINE REGION - 1941

				1.			<del>.                                    </del>			<del>, -</del> -			,						,	,			_
CO m tt	Per	Strip	Acre	\$2.69	1.92	2.07	1	1	ı	2.74	3.03	1	1	2,56	2.37	2.35	1		i	7.15	5.07	l	
Cost Per Acre Basis	of	Acres Covered	By Check	\$.153	.053		1			.134	110			,119					1		.123		
		Total	Cost	\$ 3,979.39	361.83	739.59	69.09	36.41	5,177.91	1,350.26	1,369.26	259,61	2,979.13		550.48	378.54	513.73	113.70	2,329,48	90.56	74.53	59.41	00 000
Strip Acres Per	Checker	Field	Man Day	2.6	3.6	3.4	ı	ı	i	3.0	7.0	1	1	3,3	3.6	3.7	ı	ı	t	1,5	\.	ı	
Strip Acres	Per	Checke r	Man Day Man Day	2.3	3.2	6.0	ı	1	ı	5.6	2.3	1	ı	ر ر ر	2.3	7.0	ı	ı	1	1,2	1.7	ı	
		Strip	Acres	1,481.2	188.7	357.8	1	ı	2,027.7	492.3	452.2	ı	944.5	301.7	252,0	161.2	,1	ì	695.5	13.3	14.7	-	0 00
ctive Davs	Percent	Jo	Total	76.8	7.0	14.3	1.2	0.7	100.0	45.3	746.0	8.7	100,0	33.2	23.6	16,3	22,1	4.8	100.0	41.5	32.5	26.0	000
Effective Man Days			Number	655-6/8	59-5/8	121-7/8	10	9	853-2/8	213-2/8	216-2/8	41	8/4-014	_	99-2/8	68-2/8	95-5/8	20-4/8	h20		8-5/8		18/11/30
1			Activity	Regular Checking	Advance Checking	Post Checking	Eradication	Fire	Total	Regular Checking	Post Checking	Eradication	Total	Regular Checking	Advance Checking	Post Checking	Eradication	Fire	Total	Regular Checking	Post Checking	Eradication	To+cP
			Operation			Eldorado-Stanislaus Post Checking	National Forests				Sierra	National Forest				Yosemi te	National Park				Kings Canyon	National Park	

TABLE 3 (CONTINUED)

ANALYSIS OF CHECKING COST AND PRODUCTION IN THE SUGAR PINE REGION - 1941

				1.							,	, -					<b></b>		
Co sp.	Per	Strip	Acre	\$2.83	2.55	8	2.72	ı			J	2.84	2.82	2.56	\$2.78	1	ı	ı	1
Cost Per Acre Basis	of	Acres Covered	By Check	\$.154	980•	₹00.	.102	1	1		1	.156	960*	•056	\$.105		1	ı	i
		To tal	Cost	\$ 8,351.93	2,893,33	2,561.92	13,807.18	959-93	156.66	468.31	15,392.08	8,830.01	5,374.53	2,728.77	16,933,31	1,193,36	462.28	468.31	\$19,057.26
Strip Acres Per	Checker	Field	Day Man Day		3.0	3.0	∾ «	ı	i		į	2.6	3.1	3.1		-	ı	ı	ı
Strip	Per	Checker	Man Day	2.2	7.0	2.5	2.3	1	ı		1	2.2	고. 신	2.6	2.3	ı	ı	ı	ı
		Strip	Acres	2,951.7	1,134.0	985.9	5,071.6	ł	ı	-	-	3,106.5	1,909.2	1,065.5	6,081.2	1	ı	ı	1
ective Days	Percent	ot	Total	54.1	18.7	16.6	4.68	η <b>.</b> 9	1.0	3.2	100.0	8*917	5			6.5	2.3	2.5	100.0
Effective May Days			Number	353-71	465-7/8	115	/9-	161-2/8	24-1/8	75-4/8	2,495-5/8	1,428-3/8	838-4/8	141	2,707-7/8	197-5/8	71-6/8	75-4/8	3,052-6/8
			Activity	Regular Checking 1,	ħΛ		- 1	Eradication	Pine Counting	Fire	Total	Regular Cherking 1,428-3	Advance Checking	Post Checking	All Checking	Eradication	Pine Counting	Fire	Total   3,
			Operation					California							Sugar Pine	Region			

TABLE 4

ANALYSIS OF ALL REGULAR CHECKING IN THE SUGAR PINE REGION - 1941

					Numi	Number of Check	Check					
		First Check	Check			Rech	Rechecks		A11	Regular	Checks	
	Man		Total	Cost Per	Man		Total	Cost	Man		Total	Cost
Operation	Days	Acres	Cost	Acre	Days	Acres	Cost	Acre	Days	Acres	Cost	Acre
Oregon	29	2,636	2,636 \$ 429.95	\$.163	8/4-2	391	\$ 48.13	\$,123	8/4-42	3,027	\$ 478,08	\$.158
Klamath	0 1				2,000						1	1
Mational Forest	5/5-46	25-5/8 2,451	545.52	.141	19-6/8 1,103	1,103	122.16	.111	75-1/8	3,534	454,68	.131
National Forest	227	8,547	8,547 1,478,63	.173	32-3/8 1,041	1,041	210.88	.203	259-3/8	9,588	1,689,51	9/1.
Eldorado-Stanislaus National Forests	520-11/8	520-11/8 26.057	7 158 67	כר	12E-2/8 E 202	200	72 OCX		(3) (2) (3)	13. 12		
Sierra			() - () - ()	1	0/3 (74	(5)	•	:		000,40	7:717:7	) > T •
Mational Forest	192-6/8	10,062	192-6/8 10,062 1,220.46	.121	20-4/8	942	129.80	.138	213-2/8 11,004	11,004	2.356.4	123
Yosemite National Park	132-3/8	132-3/8 6.516	734.27	בון.		256			וא/צ-סצנ	C 77 9	772 03	
Kings Canyon						)			016-66			
National Park	11	514	90-36	.185	ı	ı	ŀ	1	11	514	95,06	,185
California Totals	1,139	54,127	7,029.51	.130	.130 214-7/8 8,545	8,545	1,322,42	.155	.155 1,353-7/8 62,672	62,672	8,351.63	•
Sugar Pine Region	1,206	56,763	56,763 \$7,459.46 \$.131   222-3/8 8,936 \$1,370.55 \$.153   1,428-3/8   65,699   \$8,830.01   \$.134	\$-131	222-3/8	8,936	\$1,370.55	\$.153	1,428-3/8	62,699	\$8,830.01	\$.134

-55-

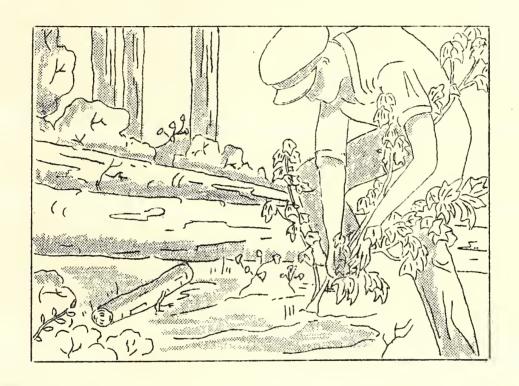
-56-

PART Y

SCOUTING FOR WHITE PINE BLISTER RUST

By

Douglas R. Miller, Associate Forester



The status of the spread of white pine blister rust (Cronartium ribicola) at the beginning of the 1941 scouting season was as follows:

Oregon: Blister rust was discovered in Oregon in 1925. Since then it has spread southward and in 1936 was located on sugar pines and Ribes in the northern end of the sugar pine belt. By the end of 1940, infection centers had been found throughout the white and sugar pine stands of both the Coast and Cascade Ranges. The disease was not uncommon on the Umpqua, Rogue River, and Siskiyou National Forests at those locations which were particularly favorable to its incidence and development.

California: Blister rust was first found in California in 1936, and by the end of 1940 it had been found in the following locations:

- 1. The Sierra Nevada Mountains
  - a. On sugar pine 107 miles south of the Oregon line.
  - b. On Ribes 160 miles south of the Oregon line.

#### 2. The Coast Range

- a. On sugar pine 42 miles south of the Oregon line.
- b. On Ribes 125 miles south of the Oregon line.

In 1936 the rust was found on both sugar pines and Ribes but was confined to a narrow strip just south of the Oregon line on the Klamath National Forest. Weather conditions during the spring of 1937 were favorable to aeciospore dissemination as well as to Ribes infection, and, as a result, the rust spread southward for a distance of 120 miles to the southern end of the Cascades and northern end of the Sierras and 125 miles in the Coast Range. The spring of 1938 was another good year for aeciospore dissemination as well as Ribes infection; however, the greater volume of spores was apparently borne by wind currents to the Sierra Nevada Range. As a result, an infected Ribes was found 160 miles south of the Oregon line at Cascade on the Plumas National Forest. Blister rust infection on Ribes in 1939 was confined to the vicinity of the only known sporulating cankers in California which were in the infection area at the East Fork of Indian Creek on the Klamath National Forest.

Climatic conditions during the spring of 1940 were favorable to rust development; but, as in 1939, there was no long range spore dispersal, which resulted in a total lack of Ribes infection except in the vicinity of the sporulating cankers on the Klamath National Forest.

An examination of the sugar pines on areas where Ribes infection had been found during 1937 and 1938, however, revealed cankers at Montgomery Creek which lies between the Shasta and Lassen National Forests, at Viola on the Lassen National Forest, and at fourteen points on the Klamath National Forest. These finds extended the known range of blister rust on sugar pines to 42 miles south of the Oregon line on the Klamath National Forest and to 107 miles on the Lassen National Forest.

## ORGANIZATION AND METHODS OF WORK

During the first week of May, 1941 an ERA party of six scouts and a cook under the supervision of the project leader went to the Klamath National Forest to scout for blister rust on sugar pines. The scouting lasted about a month and then the party moved to the Trinity National Forest where it conducted Ribes and sugar pine reconnaissance. The camp was dismantled and the men released during the last week of June as ERA funds were no longer available.

The organized scouting party in California from July 17 on consisted of D. R. Miller and C. N. Partington. In addition, members of the Division of Forest Pathology and of the blister rust personnel of all agencies on the various operations both in Oregon and California made observations along with their other duties.

The mechanics of scouting used in 1941 were practically the same as those described in the 1940 Annual Report. The only exception was that more stress was placed on locating areas favorable to the incidence and establishment of the rust than had been done heretofore. In other words, much time was spent searching for suitably sized openings in both timber and brush canopy which had proper exposure, surface moisture present, numerous Ribes and young sugar pines growing at the margins, and which were located within the proper

altitudinal range. When a spot meeting most of these qualifications was located, all young sugar pines and Ribes were thoroughly examined for blister rust. The rust appears to have been exacting in its choice of these "favorable spots", and this choice varied somewhat from forest to forest. For example, on the Klamath National Forest these spots were about equally distributed from the stream bottoms to the ridge tops (perhaps because of the presence of Ribes sanguineum at the higher elevations) while on the Lassen and Plumas National Forests the rust was nearly always confined to the favorable spots along streams.

## WORK PERFORMED AND RESULTS OBTAINED

The aim of the 1941 scouting program was threefold: first, to ascertain whether a long distance spread of the rust had occurred from acciospores produced in the north; secondly, to determine the extent of the rust on the Klamath National Forest; and thirdly, to determine whether the rust had returned to sugar pines on those areas on the Lassen and Plumas National Forests where Ribes infection had occurred in 1937 and 1938.

J. L. Mielke and J. W. Kimmey of the Division of Forest Pathology made a study of wind charts for the first half of 1941 and found that there were no strong prevailing winds from the north during the period of aeciospore production. As a result of this study, it was predicted that 1941 would be a poor year for long-distance spread of the rust, even though a field inspection showed moisture conditions and Ribes leaf development to be favorable for Ribes infection over most of the northern part of California. When wide-spread scouting failed to reveal infections of C. ribicola on Ribes except in the vicinity of sporulating cankers, it thus became evident that no long-distance spread of the rust had occurred from aeciospores produced in the north.

After scouting in the vicinities of Montgomery Creek and Viola revealed considerable rust on sugar pines, it was thought best to go to the extreme southern end of the known 1938 infection zone and see if any rust had developed there. When several infection centers on sugar pines were located on the southern end of the Plumas National Forest, it was assumed that other centers existed in the intervening country between this area and Viola. Hence, the next logical move seemed southward to determine the southern outpost of the rust; consequently, scouting was done on the Tahoe and Eldorado National Forests. Since no rust was found on these two forests, the scouts finished the season at Crater Lake National Park and on the Shasta National Forest.

There were 91,045 Ribes examined for blister rust in California during the season of 1941, and of this number 26,900 (of which 26,100 were in the Hungry Creek drainage on the Klamath National Forest) were infected. Of the 24,739 sugar pines examined, 592 had one or more cankers. In Oregon, 9,688 Ribes were inspected for the rust, of which 530 were diseased. There were 5,254 sugar pines examined of which 125 were infected, and of 341 western white pines examined 40 were infected. In addition, 300 white bark pines examined showed no infection. There were nine species of Ribes represented in California and twelve in Oregon.

The 1941 season appeared to be favorable for the spread and intensification of pinyon rust in the southern portion of the Cascade Range and in the northern Sierras as this rust was found in practically every location

where blister rust was found. Pinyon rust was particularly heavy on the southern end of the Plumas National Forest where 136 infected bushes, out of a total of 196 for the state, were found.

Finding the two rusts on Ribes in the same vicinity so frequently indicated that their requirements for establishment and intensification are similar. If this is true, then those spots where pinyon rust is located, in the southern portion of the sugar pine belt where no blister rust yet has been found, should afford excellent "indicator spots" for future blister rust searches.

It was noted during the past summer that, when a leaf of Ribes roezli (the most common host of both blister and pinyon rusts in the Sierras) had from 30 to 60 per cent of its under surface covered with blister rust telia, the leaf would drop from the bush. On the other hand, a great many leaves infected with pinyon rust were observed to be completely covered with telia and yet remain on the bush. In the fall when rust intensification has had a chance to reach its peak, this characteristic of pinyon rust may make it possible to distinguish between the two rusts on certain bushes.

Conditions favoring the establishment and intensification of blister rust appear to be much more uniform in the Umpqua, Cascade, and Siskiyou Mountains, then they are in the Sierra Nevada. The most favorable spots for rust development on the Lassen and Plumas National Forests may be just as favorable as the best spots on the Klamath National Forest, but they are much smaller in area. Because these favorable spots are smaller and occur less frequently in the Sierras, the intensification of the rust will probably take place more slowly there than farther north. However, when an abnormally wet season occurs in the Sierras, this lack of uniformity of favorable conditions will be lessened or perhaps completely eliminated for that season.

All known cankers and most of the infected Ribes bushes on the Lassen and Plumas National Forests were removed in an effort to retard the intensification and southward spread of the rust. Much of the infection occurring elsewhere was also removed.

#### OREGON

## Scouting on the Umpqua National Forest

There was no organized scouting crew on the Umpqua National Forest. Lyle N. Anderson and H. L. Hammond, the latter a member of the combination timber survey and blister rust checking party sponsored by the Forest Service, did some scouting in conjunction with their other duties. Of necessity, scouting was limited to the area being covered by the survey, but from the results the rust seems to have been confined to the streams and nearby slopes where the Ribes population was the heaviest. The fact that most of the upland type was practically Ribes-free probably accounts for the rust being only on or near the streams. It was also noted that the rust is quite generally established at most of the sites which are highly favorable to its incidence; on the other hand, no sugar pine center was found to be heavily infected. This may be due to the fact that relatively few sugar pines occur along the streams. Blister rust on both sugar pines and Ribes was found on the Straight Creek, Coffee Pot, Paradise Camp, Fish Lake, and Camp Comfort areas. Fruiting cankers were rather common, and occasionally an isolated canker which had sporulated was found.

## Scouting on the Rogue River National Forest

The small amount of scouting on the Rogue River National Forest was done in conjunction with other work. C. P. Wessela located 25 infected sugar pines with 75 cankers, many of which had sporulated, and 47 infected Ribes sanguineum out of 47 examined on the Middle Fork of the Rogue River. He also located one infected western white pine with one non-sporulating canker in the Imnaha area.

At Buck Creek, H. R. Offord and L. P. Winslew located 27 infected white pines with about 100 cankers, many of which had fruited, and several infected R. bracteosum, R. viscosissimum and R. binominatum. This infection center was in a wide stream bottom giving an excellent opening and exposure for rust incidence while Ribes and pines were common. They found one infected sugar pine in the vicinity of Union Creek along the Rogue River gorge. Ribes were few at this location, but those present were in favorable association with sugar pines. This was an extremely moist site. Offord and Winslow also located one infected R. lobbii in an old burn which afforded excellent exposure at Buck Basin. Sugar pines are common on this area, but Ribes are scarce, as eradication work was performed in 1939.

One infected sugar pine with one non-sporulating canker was found by Wessela on Salt Creek in an area where both Ribes and pines are scarce. Since scouting was done here in early June, no infected Ribes were located. Wessela also found an infection center on the West Fork of Evans Creek in early June consisting of twelve infected trees with about 50 cankers, some of which were sporulating. The diseased trees were located on a low relling ridge at the edge of an old burn which afforded conditions favorable to infection. Ribes are comparatively few in this area.

Wessela and G. J. Taylor located an infection center at the edge of an opening made when the road was built at Tub Springs. There were three diseased sugar pines with four cankers some of which had fruited. Of the twenty-two R. sanguineum examined, all were heavily infected and some infected R. lobbii were also located.

Blister rust infection on western white pines was found on Flat Creek by J. L. Bedwell of the Division of Forest Pathology in an area where Ribes infection had been located in both 1937 and 1933.

Only a few man days were spent on scouting on the Rogue River National Forest, yet rust was located at nearly every point examined. From these results, it appears that the rust is generally established at practically all the most favorable locations on the forest.

# Scouting on the Siskiyou National Forest

There was little scouting on the Siskiyou National Forest, but this small amount of searching revealed the rust at several places. Wessela and Anderson located a center of 24 infected trees having 85 cankers on the Marial road where sugar pines are numerous but Ribes are scarce. Judging by the amount of infection now present, this is a particularly favorable site for the rust. They also located one infected tree with two cankers at the head

of a small draw (in the vicinity of Trapper's cabin) where there were numerous pines but few Ribes. This area was burned over years ago and now forms a typical spot for the incidence of the rust. Wessela and Anderson also located an infection center of six sugar pines having 14 cankers in an old burn at Saw Mill Gap.

A checker by the name of Wallace located the rust on a sugar pine in the vicinity of Bunker Hill Mine while taking data on his check strip. Since the tree had two sporulating cankers, several infected Ribes bushes were found nearby.

One other infection center was discovered on this forest by T. H. Harris and L. N. Anderson on the Silver Fork area. Both pines and Ribes were few there; however, of six pines located and examined, three were infected with five cankers. There were 15 Ribes bractosum infected out of 15 found and examined.

There were five blister rust infection centers on sugar pines located on the Siskiyou Mational Forest ranging in size from one tree with two cankers to 24 trees with 85 cankers, and it is of interest to note that there were sporulating cankers present at each area.

## Scouting on the Klamath National Forest

Blister rust was found by Offord and Winslow at one point on that portion of the Klamath National Forest which extends northward into Oregon. This infection was limited to one non-sporulating canker on one sugar pine at Cottonwood Creek in an area where the Ribes had been removed in 1939. Since the canker was of 1937 or 1938 origin, it was well established before the Ribes eradication work was done.

# Scouting on the Crater Lake National Park

There was some scouting for blister rust done on the Crater Lake National Park by Miller and Partington during the last week of September. About 300 white bark pines and 700 Ribes crythrocaroum were examined on the crater rim between Skell Head and Kerr Notch, but no rust was found in that area. Scouting along Annie Creek in the southern portion of the park did reveal the rust to be present, as seven western white pines with 15 cankers, some of which had sporulated, and one sugar pine with one non-sporulating canker were located. In addition, there were 72 R. inerme, 50 R. viscosissimum, 22 R. binominatum, five R. lacustre, and one R. cereum infected in this area. The infected R. cereum is of much interest because, as far as it is known, this was the first time the species had ever been found infected under natural conditions. The bush was situated under a sporulating canker and was entwined with a heavily infected R. viscosissimum; even then only three leaves were found to be infected. The discovery of rust on Annie Creek was of comparatively little significance as the disease was known to have been established in areas surround ing the park, but this was the first season the rust had actually been located within the park boundary.

## CALIFORNIA

## Scouting on the Klamath National Forest

The scouting season opened on the Klamath National Forest with a small party of ERA men working out of Happy Camp. Several of the sugar pine infoction centers located in 1940 were reexamined to see what progress was being made by the rust. In those areas where the sugar pines were making good growth and had thrifty crowns, the rust appeared to be reacting normally, as better than 25 per cent of the cankers were producing acciosperes. On the poorer timber sites slow growing and suppressed sugar pines, which are characterized by long slender twigs with the needles in a tuft at their ends, have few if any sperulating cankers. The failure of these twigs to produce accia may be due either to their smallness which allows them to be readily killed by the rust or to the small amount of food produced by the tree which is probably inadequate to permit the fungus to accumulate enough surplus energy for the production of fruiting bodies.

Insects or rodents seem to be fond of the cankers in the pycnial stage, as many otherwise normal appearing cankers were badly chewed. A greater proportion of the cankers on the slower growing trees showed this type of damage than did the cankers on the faster growing trees.

During the month of May, six new infection centers on sugar pines were located ranging in size from one tree with one canker to about 50 trees with 200 cankers. The Slater Butte-Tanner Mountain road infection center had several fruiting cankers.

During the first week of July, Wessela and Miller examined numerous sugar pines and Ribes in the vicinity of the Hungry Creek camp in the control unit near Hilt and found many of each host to be infected with blister rust. Several of the cankers had sporulated in the spring which resulted in the heavy Ribes infection in this area. Later in the season, W. V. Benedict, Wessela, Anderson, and members of the eradication camp (this latter group examined every bush eradicated) located approximately 150 infected sugar pines and over 26,100 infected Ribes scattered over the Hungry Creek basin. Rains occurred on this area nearly every week throughout the summer, causing the production of enormous quantities of urediospores and these in turn spread the rust from Ribes to Ribes throughout the season. As a result of this continuous spread of the rust, by the end of September practically every R. sanguineum in the Hungry Creek basin was infected.

Because of this tremendous build-up of the rust resulting from urediospores, the history of the area is quite important. The area had been practically clear-cut and logged from 20 to 30 years ago; there were, however, small pockets of mature trees left in the more inaccessible places and at spots where the quality, size, and quantity of timber was such that it was unprofitable to log. In some places, much of the advance reproduction that was present at the time of logging was saved, while in other spots, little, if any, remained; and in one area of about 1,000 acres everything was burned. The area now supports a good stand of sugar pine reproduction of two age classes; that which survived logging and that which has come in after logging. Sugar pine on the burned area is coming in now but is much younger than pine on the surrounding area.

The density of the Ribes population varies from a few (five to thirty) bushes per acre on ridge tops and on south and west slopes to 150 bushes or more per acre along streams and on north and east slopes. For the 3,629 acres in this area that were treated during the summer of 1941 an average of 58 bushes per acre was removed. There were six species of Ribes present; namely, R. cruentum, R. klamathense, R. lacustre, R. lobbii, R. viscosissimum, and R. sanguineum. Of these, R. sanguineum made up over half of the total number, and although this species was distributed over the entire area, it was most abundant along the streams and north-facing slopes. The individual bushes of R. sanguineum were exceptionally large and well-developed, and even though there was a brush cover over most of the unit, part of the foliage of this Ribes usually protruded above the surrounding brush.

These conditions, namely, numerous large R. sanguineum (which is highly susceptible to blister rust) growing in a cutover area where there is little overhead screening with an occasional sporulating blister rust canker present, coupled with the numerous summer rains, help to explain the generally heavy intensification of the rust on Ribes on the Hungry Creek unit caused by urediospores.

## Scouting on the Trinity National Forest

Some scouting for blister rust was done on the Trinity National Forest during June. Most of the sugar pines and Ribes examined were in the vicinity of Minersville, but about 400 trees and an equal number of Ribes were examined at Donaldson Creek where infected Ribes were located in 1937. There were only a few spots in the Minersville area where Ribes were numerous enough to represent a good scouting chance. The best of these was a small meadow south of the Stuart Fork of the Trinity River in Section 2, T. 34N, R. 9W. At this point Ribes were located in a favorable position for the incidence of rust and were growing in association with a few scattered sugar pines. No rust was found on this forest; however, scouting was done early in the season and before rust on Ribes would have had much of a chance to develop.

Blister rust was found by Partington during the first week of December on Ribes menziesii on the Redwood Highway where it crosses the Mendocino-Humboldt County line. This point lies west of the southwest corner of the Trinity National Forest and is out of the sugar pine range. Partington also located three more infected R. menziesii during the last week of December. These were on the Navarro River in Sec. 11, T. 15N., R. 17W. which is near the coast about 200 miles south of the Oregon line. Sugar pine was lacking at all these coastal discoveries.

# Scouting on the Shasta National Forest

Scouting on the Shasta National Forest was limited to Damnation and Blodgett Creeks in the Clear Creek drainage. Rust was first found on Ribes here in 1937. In the spring and summer of 1941 J. L. Mielke and J. W. Kimmey of the Division of Forest Pathology located several small infection centers on sugar pines in the vicinity of their "Ribes to Pine Spread Plots". They also noted that bushes of Ribes roezli in this area were practically immune to rust infection.

During the middle of October, Sovulewski and Miller spent about a week on this area examining pines and Ribes and removing cankers from infected trees. It was found that, although the rust is fairly well distributed throughout the Clear Creek drainage, it is confined to the stream bottoms and the first three to five chains of the adjacent slopes, the natural habitat of R. nevadense. Some of the cankers in this area had sporulated during the spring, and, as a result, Ribes infection was not uncommon. Of 150 R. roezli bushes examined, only three were diseased and these had only a few leaves infected per bush, whereas of the 300 R. nevadense bushes examined 90 bushes were infected and many showed heavy intensification of the rust. In many cases, where R. roezli and R. nevadense were growing side by side, the former showed no rust whereas the latter would be heavily infected.

A few isolated cankers were found that had produced aeciospores in the spring, and one isolated canker with a considerable number of fresh aeciospores was found in October. Although a thorough search for other cankers in the vicinity of the sporulating cankers was made, none were found. Since several isolated cankers that had sporulated during the spring or summer were observed, it appears that an admixture of pycnial drops between cankers is not always necessary for the production of aeciospores when the isolated canker is on a thrifty growing sugar pine.

Most of the cankers in this area were removed, but because of adverse weather conditions during the latter part of the scouting season the job was not completed.

## Scouting On and Adjacent to the Lassen National Forest

The south fork of Montgomery Creek was scouted in April by J. L. Mielke and J. W. Kimmey of the Division of Forest Pathology. At the Montgomery Creek infection center they found several infected sugar pines some of which had sporulating cankers. Two Ribes bushes infected with blister rust were located here in 1937 and about 300 more infected bushes in 1938. One blister rust canker on sugar pine was also found on this area in the spring of 1940.

On July 18 Miller and Partington began an examination of the sugar pines and Ribes in the Hatchet, Montgomery, and Goat Creeks area. At the south fork of the Montgomery Creak area 27 infected trees with 49 cankers, ten of which had produced acciospores, and over 160 infected Ribes were located. Although the Ribes averaged about 150 per acre at the center of this infection, there are only eight to ten sugar pines per acre, which probably accounts for the light return of the rust from Ribes in 1938.

This area is heavily grazed by cattle and deer from early spring to late fall, and there are numerous well worn paths through the brush. The rust was definitely intensified on Ribes by cattle, as most of the outlying spots were along those trails worn through the brush by cattle, and usually those Ribes limbs which protruded into the trail harbored all the infection on the bush. From all appearances, the rust was intensified on Ribes by the same procedure in 1938.

Blister rust was found on six sugar pines and two Ribes in the Little Hatchet Creek drainage, but none of the pine cankers had sporulated. Rust was also found in the Hatchet Creek drainage in the vicinity of Buckhorn Lodge on three sugar pines and on 57 R. roezli bushes. At this location one fruiting canker was located which accounted for the many infected Ribes bushes. This sporulating canker was at least three chains from the only other canker in the vicinity; and, although an admixture of pycnial drops could have occurred, the chances of such an admixture are rather remote. Several infected R. roezli were found at the edge of a small burn about eight chains northwest of the sporulating canker, and this area has many young sugar pines present. The burn will bear close watching in the future. All blister rust cankers and most of the infected Ribes were removed so as to retard the build-up of the rust. A few bushes infected with pinyon rust were intermingled with those infected with blister rust.

Scouting on the North Fork of Montgomery Creek revealed only two infected Ribes nevadense (one additional R. roezli was infected with pinyon rust), although several infected Ribes had been located along this stream in 1938.

Scouting on the small stream below Indian Springs disclosed three infected sugar pines, ten infected R. roezli, and 7l infected R. nevadense. Ribes along this stream were mostly R. nevadense hence the reason for so many infected currant bushes. One of the diseased pines was growing in a fertile stream bottom and was making exceptionally rapid growth. This tree had 18 cankers, seven of which were on 1938 wood and two of these, as well as three others on older wood, had produced acciospores during the spring of 1941.

Scouting at the old Terry Mill site revealed the rust to be present, as one infected sugar pine with one nonsporulating canker and eight infected Ribes roezli were located. The Ribes-infecting spores probably came from the South Fork of Montgomery Creek, as that infection center is only about one mile east of the Terry Mill area.

The next area to be examined was the Goat-Creek-Goat Meadow county where considerable rust was found on Ribes in 1938. A total of 41 infected pines with 53 non-sporulating cankers were located scattered along Goat Creek and along the south and east sides of Goat Meadow, making the two extreme ends of the infection well over a mile apart. The rust on Ribes was generally light, and of the 65 infected bushes which were about equally distributed over the area only a few showed heavy intensification of the disease. The infecting acciospores appear to have been produced elsewhere because no concentration of infected bushes was found such as occurs when a fruiting canker is near. Since the infection centers on Indian Springs Creek and the South Fork of Montgomery Creek are only two miles south of this area, it is quite likely the acciospores which infected the Ribes were produced at one or at both of those centers.

Scouting activities were shifted to the Bailey Creek infection center at Viola where numerous infected Ribes had been located in 1938 and where two cankers on sugar pines were found in 1940. An intensive examination of this area produced 73 infected sugar pines (including those located previously) with 119 non-sporulating cankers and four infected Ribes. The infected sugar

pines were scattered over a course of about two miles along Bailey Creek with the heaviest center just above and below the bridge. The infection on most of the trees below the bridge was located in the upper part of the crown from four to eight feet from the ground; also many of the trees were from two to three chains from the nearest Ribes bush and had only one canker per tree, all of which indicated that a comparatively long spread from Ribes to pine had occurred.

Nearly all the infected sugar pines were in the suppressed crown class, as there is a mature stand of timber overhead; hence, the rust has made slow development. In fact, some of the cankers were just becoming visible at the time of examination. They had a small amount of swelling and discoloration which made their detection difficult. That is probably the reason that only two cankers were found last year. The four infected Ribes were in a group indicating possibly a single aeciospore hit. Two additional diseased bushes were located in this general area, one on the dam at the McCumber Flat Reservoir, and the other about forty chains below on the North Fork of Battle Creek. The aeciospores causing these infections had probably disseminated from the Montgomery Creek infection center.

## Scouting on the Plumas National Forest

Since the scouting program on the northern end of the Lassen National Forest had revealed the rust on sugar pines at almost every point where it had been found on Ribes in 1938, it was decided to transfer activities to the locality of the southernmost known point of Ribes infection in 1938, the Cascade area on the Plumas National Forest. Although one lightly infected Ribes roezli had been found near the Cascade Hotel in 1938, no infected pines were found there in 1941. An intensive examination of sugar pines and Ribes on Cascade Creek resulted in the discovery of four infected pines scattered over a distance of about two miles.

Ten more diseased pines were found on the South Branch of the Middle Fork of the Feather River; of the 17 cankers found, five had produced acciospores causing an intensification of rust on nearby Ribes. The infected trees, located at six separate points, were distributed along the South Branch for a distance of more than two miles. At all locations except one, infection was confined to a single tree; however, at a point about 20 chains below Hartman's Bar Crossing, five infected trees were found. Of these five trees, four had single cankers; the remaining one had six cankers, five of which had fruited earlier in the spring. The ten cankers at this one center of five trees were all exceedingly large and well-developed when compared as a group with those found elsewhere in the Sierras. Also, five of the ten cankers had produced acciospores and each of the fruiting cankers had numerous large accial scars. After comparing this group of cankers with those found elsewhere, it would appear that they are of 1937 origin, but the evidence is not conclusive.

Blister rust on four Ribes was picked up at two separate spots on Fall River southeast of Camel's Peak Lookout. Blister rust was also found on one R. roezli on the old Scales mining ditch north of the Lucky Gold Hill Mine. This latter infection was among 42 pinyon rust infections found along the ditch.

Pine infection was located at three places on Lost Creek about a mile below the McIntosh trail crossing. Cankers at two of the areas had fruited earlier in the season, and as a result most of the nearby Ribes were infected. Some of the bushes within a few feet of the sporulating cankers had been so heavily infected that when they were examined in mid-September only a few tip leaves remained. Defoliation had not occurred before the fruits had had a chance to ripen, which produced a strange sight - Ribes roezli branches heavily laden with fruit but with few, if any, visible leaves. In some cases these tip leaves had been produced after the infected leaves had dropped, or at least after the last crop of urediospores, as they were not infected. There were thirteen infected trees at these three centers, and of the 51 cankers, four had sporulated.

One sugar pine with two non-sporulating cankers was found on Sly Creck about six miles south of Cascade. This find extended the known range of blister rust six miles farther south.

There were twelve sugar pine infection centers located on the southern end of the Plumas National Forest ranging in size from one tree with one canker to seven trees with 40 cankers. Acciospores had been produced at three centers, two on Lost Creek and one on the South Branch.

Of all the new infection centers found in the Sugar Pine Region during the 1941 season, the discoveries on this forest are probably the most significant. They not only extend the known limits of infected sugar pines about 60 miles farther south, but also advance the known infection zone for either host about six miles deeper into the sugar pine stands of the Sierras.

## Scouting on the Tahoe National Forest

When the search for blister rust on the southern end of the Plumas National Forest was discontinued because of lack of time, the rust had been located on sugar pines four and one-half miles northwest of the Plumas-Tahoe boundary and on Ribes only one-half mile northwest of the boundary. search was continued on the northern end of the Tahoc National Forest to determine whether the rust had spread southward either in 1938 or in 1941. Areas were examined along Fiddle Creek, Cherokee Creek, Eureka Diggings, Little Canyon Creek, Haypress and Plum Crecks, Rock Creek, and Pliocene Ridge, Oregon Creek from Coles Mill to Forest, Bloody Run Creek, and the South Fork of Poor Man Creek. Pinyon rust on Ribes was located at all of these sites, but the results were negative as far as blister rust was concerned. It was noted, however, that conditions are much different on the northern end of the Tahoe National Forest than they are on the southern end of the Plumas National Forest, even though Canyon Creek was all that separated the two districts. Both Ribes and sugar pines were fewer in number on the Tahoc National Forest, the area was more arid, and resembled the Plumas foothill country. Areas on the Plumas National Forest most favorable for the rust were about 4,000 feet in elevation, but to get similar conditions on the Tahoe National Forest it was necessary to go up to 5,000 feet. There appeared to be a 1,000 foot rise in the same life zone when going from the Plumas to the Tahoc; however, it appears that snow remains longer in the spring at the 5,000 foot level on the Tahoe than it does at the 4,000 foot level on the Plumas. This may account for the fact that even though rust is quite generally scattered over the more favorable spots on the Plumas, none was found on the most favorable spots on the Tahoe.

There was some scouting done at French Meadow on the extreme south end of the Tahoe National Forest. Conditions here are similar to those farther north on the forest. Although the season was far advanced and many Ribes leaves had fallen, in fact, no leaves remained on a portion of the Ribes, it was quite easy to locate pinyon rust. No blister rust was found.

## Scouting on the Eldorado National Forest

Some of the most favorable spots for blister rust on the northern end of the Eldorado National Forest were examined during the second week in October. Areas thus examined were Lower Meadow, Big Meadow, South Fork of Long Canyon, junction of Big Meadow road with the main road, Chipmunk Creek, Kennedy, a small meadow at the junction of Pilot and Plum Creeks, Kings Meadow, Cold Springs, Long Meadow, the meadow at Schleins Guard Station, and portions of Pilot Creek. Several infections of pinyon rust were located, even though many Ribes bushes were completely defoliated.

## Scouting Elsewhere

Some scouting was done on the Stanislaus and Sierra National Forests and on Yosemite National Park by members of the eradication forces. Two pinyon rust infections on the Stanislaus National Forest and one in Yosemite National Park were located.

## SUMMARY

The following table is a record of the blister rust infections found in Oregon and California during 1941 and shows for each infection center the information listed: location, the name and number of each host examined as well as the number of each infected, whether sporulating cankers were present, the name of the inspector, and any other valuable information regarding the area.

The results of the 1941 scouting season, in brief, are:

# Oregon

- 1. Blister rust is generally established in southern Oregon at those places where conditions are highly favorable for its incidence and development.
- 2. New blister rust infections were located on the Umpqua, Rogue River, Siskiyou, and Klamath National Forests.
- 3. Blister rust was found for the first time (on both pines and Ribes) in Crater Lake National Park.
- 4. Blister rust was found for the first time on native Ribes cereum.

## California

- 1. Scouting revealed that no long-distance spread of blister rust in the Sierras had occurred in 1941, as the only infected Ribes located were in the vicinity of sporulating cankers.
- 2. Infected sugar pines were found at nearly every area examined where Ribes infection had been located in 1938.
- 3. The infection zone in the Sierras was moved six miles farther south when a diseased sugar pine was located on Sly Creek on the southern end of the Plumas National Forest. This find also extended the known infection on sugar pine about 60 miles farther south.
- 4. Blister rust is becoming thoroughly established on the Klamath National Forest. Six new sugar pine infection centers were located. Since much sporulation of cankers occurred during the spring and weather conditions for infection and intensification were highly favorable throughout the spring and summer, infected Ribes were numerous and undoubtedly many additional sugar pine became infected.
- 5. Blister rust infection was found on <u>Ribes menziesii</u> on the Navarro River at a point near the coast and about 200 miles south of the Oregon line.
- 6. Ribes roezli bushes growing on the west side of the Shasta National Forest were found to be comparatively resistant to blister rust as only three out of 150 bushes examined were infected in an area where sporulating cankers were common. Numerous infected R. nevadense were located at this infection center.
- 7. All known cankers and most of the infected Ribes bushes on the Lassen and Plumas National Forests were removed.

  Much of the infection occurring elsewhere was also removed.

RECORD OF BLISTER RUST INFECTIONS FOUND IN OREGON DURING 1941

		Remarks	Along Rogue River Gorge	Arbes tew but good host	moist site.	In saddle in old burn.	now protected. Pine		Ribes and pine common.	Excellent exposure on edge	of old burn.		Along stream at edge of old	burn. Ribes and pine	rather scarce but there was	good association at this	Pine rather scarce but	•	Infection at edge of open-	ing made by road.	Excellent exposure.		Both Ribes and pines are	rather scarce in this area.	
		Date			8/5		٦/٢	7/2			10/15					10/16	,				9/6			2/9	,,
		Pine Cankers Inspectors		Offord	Winslow		Offord Winslow				Wessela					Wessela				Wessela	Taylor			Wessela	
		Pine Cankers	*	<b>⊣</b> ⊢	ı		ı		*75	`	1			+		ı		* #		ı	ı		#		
		Infect.		4	0		r	l	25	١	47			-		12		~		25	<b></b>		~	0	
	HOST	Examined	02	2	10		۷2		100		7+7			15		25		10		25	10		50	10	1.3
		Species	Pinus	Ribes ve			Ribes Lobbii	Pinus	lambert.		sanguin.		Pinus	monticola	ت بر د د		Pinus	lambert.	Ribes		lobbii	Pinus	lambert.	Ribes   lobbii	1.000
		E H			318 33		ν ΕΞ	_			四 <sub>1</sub> S					新 (S)	-				)S 3至			S 37	
-		ω Γ.			5 3		15 718				11 338		<del></del>			4 338	-				2 40S			34 335	500
- 1	National Forest	and Locali ty	Rogue River	יש מייטון די מייטון	Union Creek	Rogue River		iver	National Forest	Middle Fork of	the Rogue River	Rogue River	National Forest			Imnaha	Rogue River	National Forest			Tub Springs	Rogue River	National Forest	Salt Creek	FIGURE AND AND TOWN TO THE TOTAL TO THE TOTAL
	λ	qunog										И	0	S	K	O A	ſ								*

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some cankers had produced aeciospores during the spring of 1941.

#Cankers removed

RECORD OF BLISTER RUST INFECTIONS FOUND IN OREGON DURING 1941

1							, _ ( 1														
	Remarks	Excellent exposure on top of low rolling ridge at	edge of old burn.	tion.	This infection extended along the creek for over	a mile.	Discount is seen	area. Ribes removed in	1939. Good exposure.	1			Infected sugar pines	found in Sections 9, 15,	and ji.				Infected sugar pines	found in Sections 9, 15,	16, 17, 19, and 20.
	Date			41/9		6/15			8/5					00/0	2/50					1	11/9
	Inspectors			Wessela		Bedwell		Offord	Winslow						namillona					Hammond	Anderson
	Pine Cankers	* *50	1	)		5			<b>‡</b> 1	1	28						*36				
	Infect.	12	C	00		70			1	0.5	12		太	17	7		174			다	62
HOST	Examined Infect.	50	L C	22		15		,	9	000	000		500	175	2		1,100		,	650	500   25
	Species	Pinus Lambert.	Ribes		Pinus	monticola				Pinus	Lambert.	Ribes	sanguin.,	cruentum,	_	Pinus	lambert.	,	Ribes		cruentum
_	ద			叶		)还			]E					<u> </u>	$\perp$					E	1
	E		<del></del>	338		308			740S					000						000	27,
_	w			25	22	33			32	1	5,	<u>2,5</u>	15,	16,	þ	17,	1,	17,	19	22,00	167
National Forest	and Locali ty	Rogue River National Forest	West Fork of	Evans Creek	Rogue River National Forest	Flat Creek	Klamath Wational Forest		Cottonwood Creek		National Forest			Straight Crook	Impuls	National Forest				40000	-
	Lounty		N		K 2	<del></del>	A T					5	3 ¥		Ð	U (	) (	I			- L

#Cankers removed.

Locality   S T R Species   Examined Infect. Carkers Inspectors   Date	Y	Mational Forest					HOST					
Umpqua	tunoo		ß	E⊣	_ H	Species	Examined	Infect.	Pinc Cankers		Date	Remarks
Paradise Cemp   12   298   22		Umpqua National Forest	1,			Pinus lambert.	500	5	*			
Umpqua	·····	Paradise Camp	7.00	298			450 125	25		Hammond	10/15	Infected sugar pines found only in Section 12.
Fish Lake 7 295 3E crucntum 100 1 Hammond 10/12  Mational Forest 11,  Rational Forest 21,  Rational Forest 34,  Rational Forest 34,  Rational Forest 36,  Rational Forest 37,  Ra		(U)				Pinus lambert.	500	2	*			
Mational Forest   11,	······································	Fish Leke	5-	295			350 100	10		Hammond	21/01	l sugar Section
15,   Pinus   1,600   16 *36   16 *36   16   20-   1   27-   Ribes   27-   Ribes   28,   28   28   28   28   28   28   2	S	Umpque National	3, 11, -\(\( \)									
Single   S	GPA		16,			Pinus lambert		16	*36			
oruentum 600 10 Winbauer 10/2 36 28S 2E lobbii 150 1 Anderson 10/2 Finus monticola 150 27 #*100 Ribes bract., 30 10 visco., 65 2 0fford 100 5 Offord	D O I		27.			n.	1,000	63		Hammond		
er Pinus 150 27 #*100 Ribes 150 10 bract., 30 10 visco., 65 2 linomin., 100 5		Camp Comfort	364.	288	E3		150	) r		Winbauer Anderson	10/2	ected pines Sections 21
Ribes 30 10 bract., 50 2 visco., 65 2 libinomin., 100 5		Rogue River National Forest				Pinus monticola	150	27	00I* <del>+</del>			
visco., 65 2 Offord						Ribes bract.,	30	10				Ribes and pine common.
		- (c. td.		0 0			100 100 100 100	N 7V	-	Offord	L	Wide stream bottom giving excellent opening and

Some canters had produced acciospores during the spring of 1941.

+Cankers removed

RECORD OF BLISTER RUST INFECTIONS FOUND IN OREGON DURING 1941

Examined Infect. Canters Inspectors Date    150		-			HOST					
150	H4 EH	144	<u>!</u>	Species	Examined	Infect.		Inspectors	Date	Remarks
150				Pinus						
90 10 Anderson 11/6 86 24 *85 10 3 Anderson 11/6 50 6 **14 Wessela 10 1 **2 10 1 **2 10 1 **2 10 1 **2 10 1 **5 10 1 **5 10 1 **5 10 1 **3 11/5 10 1 **5 10 1 **3 11/5 11/5 12 12 Anderson 11/5 15 15 - Anderson 1/27	- 4			lambert.	150	_		,		Ribes scarce, pine numerous
86 24 *85 Wessela 11/6 10 3 Anderson 11/6 50 6 #*14 Wessela 11/5 10 1 # *2 30 4 Wallace 9/1 50 5 # *5 Harris 1/27	Mb Scz	M6	4 4	Ribes Flutin.	Ş	0		Wessela	9/11	at head of small draw. Good exposite in old him.
2 - Wessela 11/6 10 3 Anderson 11/6 50 6 # *14 Wessela 11/5 25 10 - Anderson 11/5 10 1 # *2 30 44 50 6	L		0	Pinne					, /	
2 - Wessela 11/6 50 6 # *14 Wessela 11/5 25 10 - Anderson 11/5 10 1 # *2 30 4			4 🗀	lambert.	98	ήZ	<b>*</b> 85			Ribes scarce, sugar pines
2 - Wessela 11/6 50 6 # *14 Wessela 11/5 25 10 - Anderson 11/5 10 1 # *2 30 4										numerous. Probably a
2 - Wessela 11/6 10 5 Anderson 11/6 50 6 # *14 Wessela 11/5 10 - Anderson 11/5 30 4				Ribes						larger amount of infection
10 3 Anderson 11/6 50 6 * *14 Wessela 25 10 - Anderson 11/5 10 1 * *2 30 4 Wallace 9/1 50 5 * **5 Harris 1727				glutin.,	a	ı		Wessela		here than was revealed by
50 6 # *14 Wessela 11/5 25 10 - Anderson 11/5 10 1 # *2 30 4 10 1 # Wallace 9/1 6 3 # *5 Harris 15 15 - Anderson 7/27	325 gm (	977		cruen tum	10	~		Anderson	11/6	the brief inspection.
50 6 # *14 Wessela 11/5 25 10 - Anderson 11/5 10 1 # *2 30 4				Pinus						Ribes and pine numerous
25 10 - Anderson 11/5 10 1 # *2 30 4 10 1   Mallace 9/1 6 3 # *5   Harris 15 15 - Anderson 7/27		Н	i	lambert.	50	9	# * <sup>1</sup> <sup>†</sup>			with good association in
25 10 - Anderson 11/5 10 1 # *2 30 4 10 1   Wallace 9/1 6 3 # *5   Harris 15 15 - Anderson 7/27		व्य	òή.	Ribes				Wessela		old burn.
10 1 # *2 30 4 10 1   Mallace 9/1 6 3   # *5   Harris 15 15 - Anderson 7/27	338 8W C	8W C1	5.1	cruentum	25	10	1	Anderson	11/5	Good exposure.
10 1 # *2 30 4 10 1	114	1.14		Pinus						
30 4 Wallace 9/1 6 3 * *5 Harris 15 15 - Anderson 7/27				lambert.	10	Н				
30 4	<u> </u>	四		Ribes						This infection located by
10 1 Wallace 9/1 6 3 # *5 Harris 15 15 - Anderson 7/27	0	0		cruentum,	30	7				a checker while taking
6 3 <b>+ *</b> 5 Harris 15 15 - Anderson 7/23	35S 9m i	977 1		Sanguin.,	10	~ 1		Wallace	9/1	data on his strip. Ribes and pines few.
6 3 <b>*</b> *5 Harris 15 15 - Anderson 7/23				Pinus						
15 15 - Anderson 7/23		1,,		lambert. Ribes	9	~		Honm, a		Ribes and pines few but
	35s 9m l	11 115		bract.	15	15	1	Anderson	7/23	all Ribes are Ribes brac- teosum.

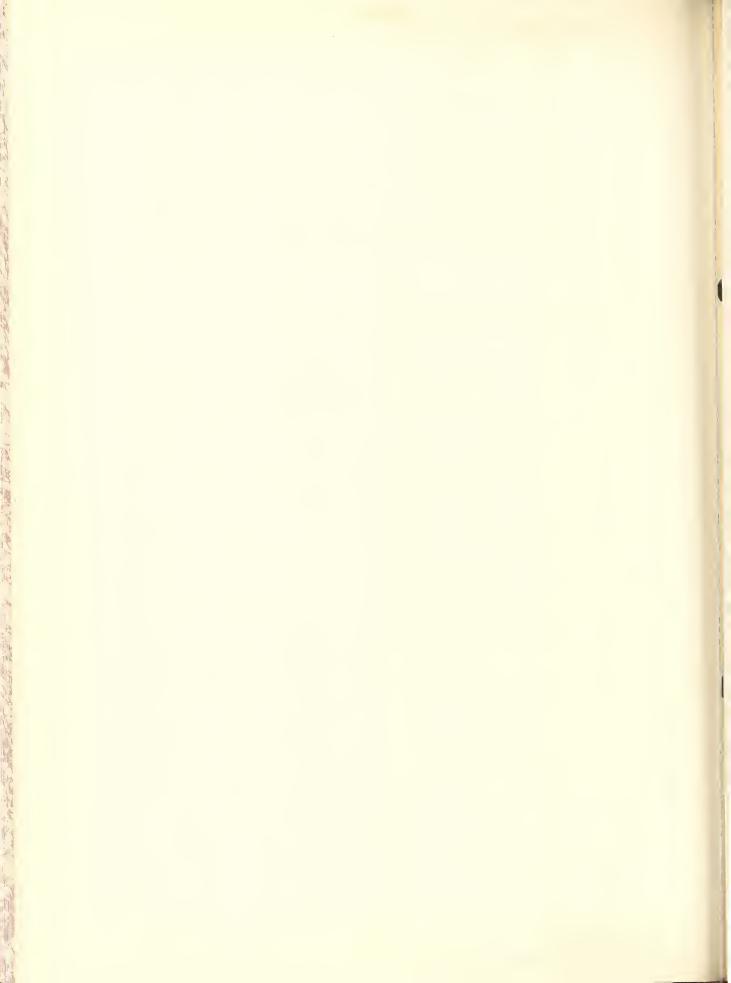
\*Some cankers had produced acciospores during the spring of 1941. #Cankers removed.

RECORD OF BLISTER RUST INFECTIONS FOUND IN OREGON DURING 1941

				1	•		r V	ver		
	Remerks		Infected pines scattered	up Annie Creek for a dis-	tance of about two miles.	Numerous Ribes infected.	One Ribes cereum infected	which is the first one ever	located infected under	natural conditions.
	Date									12/6
	Examined Infect. Cankers Inspectors								Willer	Partington 9/27
	Pine Cankers		*	* *15		ı	1	1	ı	1
	Infect.			~		72	20	22	5	1
HOST	Examined		36	191		1,000	780	240	, 1,050	160
	Species	Pinus	lambert.,	monticola	Ribes	inerme,	visco.,	binomin.,	9	6E cereum
	떮									,
	E									328
_	ω						17	13,	24,	25
National Forest	and Locality	Crater Lake	National Park							Annie Creek
λ	junog		F	I J	; }	7 J	T I	7 -	Ι Σ	I

\*Some cankers had produced aeciospores during the spring of 1941.

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	Remarks	, , , , , , , , , , , , , , , , , , ,	Infection found on both	ribes and sugar pine scattered throughout out-	over area of Hungry Creek	Camp. Most of cankers and	infected Ribes were re-	moved as Ribes eradication				Both Ribes and sugar pine	few in number at location	of infection.	Infected pine at edge of	small opening.	These cankers had a pecul-	iar appearance. They were	<del></del>	Probably 100 trees infected	Only two cankers sent in	for determination and both	were blister rust. Only	three Ribes sanguineum	located in entire area.
	Date						May	<u></u>	October						,	5/14								•	5/23
	Examined Infect. Canters Inspectors				Wessela	Willer	Anderson	Benedict	et al	Ala	Al beck	Bagley	Bart	Bell	Skaugse t	Miller							Miller	and	Party
	Pine Cankers	1	45/2		ı	1			1				Н			ı				,	9				1
	Infect.	1	7 0 7		56,000	9			95				Н			0					24				3
HOST	Examined	1	2,500		50,000	450		,	009				325			300					304				3
	Species	Pinus	Lambert	Ribes	sanguin.,	lobbii		Ribes	cruen tum			Pinus	lambert.		Ribes	11W cruentum			,	Pinus	lambert.			Ribes	46N 12W sanguin.
	(대					N 8W			N 7W							N 11.1								- 1	N 1224
-	EH	-	•			148N		,	148N							47N									46
-	ω	17	200	26,	文	36	1	<u>~</u> %	31							35									124
National Forest	and Locality	Klamath	wational Forest			Hungry Creek in	vicinity of	Blister Rust	Camp •	Klamath	National Forest					of II		National Forest				Walker Creek	Road between	Walker and Grider	Creeks
	Count										U	0	X	I	К	S	I	S							

\*Some cankers had produced aeciospores during the spring of 1941.

RECORD OF BLISTER RUST INFECTIONS FOUND IN CALIFORNIA DURING 1941

						ri ri	•			rr'	P. C.	60
	Remarks		ing canker but proved to be blister rust. Fair exposure. Ribes few.	Probably more trees and cankers as lack of time		Excellent exposure and general setup for infection	Infection located on a	steep west slope above road. Ribes are numerous		A few Ribes below the road appear to have spread the mist to a distance of 300	re above the exposure for of the rust	Many Ribes scattered along highway. No 5-needled pines present.
	Date		5/23			5/16			2/16		5/19	i
	Inspectors		Miller and Party			Miller and Party		Miller and	Party		Miller and Party	Partington
	Pine Cankers	П	ı	85*		1 1	2			190	1	1
-	Infect.	r-t	0	19		00	1	0	0	84	C	~
HOST	Examined	85	50	09	ļ	62	50	50	75	750	7	20
	Species	Pinus lambert.	Ribes cruentum	Pinus lambert.	Ribes	sanguin. cruentum	Pinus lambert.	Ribes sanguin.,	cruentum	Pinus lambert.	Ribes	
	R		127			7E			五/		ر بر	.l
	Œ		45N			17N			17N		NZL	
	ശ		20			<u> </u>			54		10, F.X	12,
National Forest	and Locality	Klamath National Forest	Grider Ridge about 8 miles up the new road.	Klamath National Forest	£	Stater Butte- Tanner Lake Road	Klamath National Forest	Indian Creek -	Slater Butte Road 24	Klameth National Forest	Dillon Mountain Road	MACH BACH HOLON U.S. High- May 101
I	launoo					O A			S		*****	BOLDT HUM-

\*Some cankers had produced aeciospores during the spring of 1941.  $^{1}\mbox{Humboldt}$  Meridian

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	Remarks	No sugar pines present.	Ribes common along highway No sugar pines present.	Ribes common but sugar pine entirely lacking.	This area is near and in- cludes the "Damnation Crcek Ribes-to Pine Spread Plots".	Most of the cankers were caused by artificial inoculation, however, many are	of 1937 origin. Over half	removed. Of much interest is the degree of resistance	Ribos roczli has for the rust in this vicinity.	This area is in the edge of the "Montgomery Creek Sottling Basin" and seems	particularly favorable to the incidence of rust. Most of the infected trees are	in small openings in the mature timber.
		No sugar p	Ribes comm No sugar p	Ribes comm	This area cludes the Ribes-to P	Most of the caused by a lation, how	of 1937 origin.	removed.		This area is in the "Montgomery Settling Basin"	particular the incided of the inf	in small o
	Date	12/7	12/7	12/28				April	to October		July	TO Nov.
	Pine Cankers Inspectors	Partington	Partington	Partington			Miclke		Sovulewski Miller		Partington	MILLER Blomstrom
			ı	1 1			*603		1 1	9 #		1 1
	Infect.	1	N	M0			150	Ç	30 3	9	C	ЛO
E C	emi ne	10	23	34 40			1,500	0	150	312	C	220 25
	Species	Ribes menziesii	Ribes menziesii	Ribes menziesii sanguin.		Pinus	lambert.	Ribes	roczli	Pinus lambort.	Ribes	roezii nevadense
-	E E	3 3E	24N 17W 23N 17W	15N 17W					N GW			N 1E
-	ω	25 58	75	11		<del> </del>	15-	15,	14   36N		13,	25 35M
Wational Forest	ا د	On U.S. High-	High- 5.	State 28 on the River	Shasta National Forest				Center road.	Lasson Wational Forest	T. ++10 Ho+040+	
	Ljunog		OCINO	INEM				ATS	A I	I S		

\*Some cankers had produced aeciospores during the spring of 1941.

#Cankers removed.
2/Mt. Diablo Meridian

RECORD OF BLISTER RUST INFECTIONS FOUND IN CALIFORNIA DURING 1941

	·····,																		
	Remarks	Many infected Ribes roezli were located in the edge of a small burn which has		Although many infected bushes were found, no con-	centration of infected bushes were located as is	the case when fruiting	appears that the aecio-	spores came from Montgomery	Creek. Excellent conditions for the incidence of the		Very few Ribes roezli in vicinity of infected pines.	Infection probably due to	R. nevadense. Pines few in vicinity of infection	center.	Few sugar pines along the		R. roezli few. Acciospores	probably from Indian	Springs Creek.
	Date		7/25 8/24						1/28	7/30			7/23	1/2 <sup>†</sup>					7/25
	Inspectors		Willer Partington						Willer	Partington			Partington	Miller				Miller	Partington
	Pine Cankers	*	1 1				<b>+</b> 53		1	ı	12* #		1	1		ı		1	1
	Infect.	~	57				41		59	9	2	`	10	71		0	(	o 0	
HOST	Examined Infect. Canters	310	350 25				3,050		1,950	940	170	<u>-</u>	155	1,350		30	(	1 40	00/
	Species	Pinus lambert.	Ribes roczli 1E nevedense			Pi mis	lambert.	F	LE Kloes roezli	1E nevadense	Pinus lambert.		Ribes roezli	1E nevadense	Pinus	lambert.	Ribes	roezil	nevadense
-	떠																	7)112	7
-	EH		5 35N						155 C	34N				0 34M		····			
National Forest	and Locality S	Lassen Wational Forest	Hatchet Creek in the vicinity of Buckhorn Lodge 26	ct Ct				7	Goat Creek and	Goat Meadow 3	Lassen Wational Forest		Indian Springs	Creek 10	Lassen	National Forest	1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Wortgomery Crook 10	OI CCK.
1	Stanoo					7	7 J	S	A H	S									3

\*Some cankers had produced aeciospores during the spring of 1941. +Cankers removed.

National Forest					HOST					
40	Ω	€	ద	Species	Examined Infect.	Infect.	Pine Cankers	Inspectors	Date	Remarks
Lassen				Pinus	_			Mielke		Both infected Ribes and
National Forest				lambert.	415	27	6t* <b>+</b>	Kimmey		sugar pines confined com-
				Ribes				Miller		paratively close to stream.
South Fork of				roezli	1,971	134	1	Partington		Excellent site for develop-
Montgomery Creek	15	34N	3	nevadense	601	30	ı	Blomstrom	7/18	ment of rust.
Lassen				Pinus						Ribes numerous over most
National Forest				lambert.	150	-	- +			of the area, however, sugar
				Ribes						pine is only occasional.
				roezli	750	Ø	ı	Willer		An excellent area for the
Old Terry Mill	16	34N	当	nevadense	100	0	ı	Partington	97/1	incidence of the rust.
Lessen				Pinus						
National Forest				lambert.	200	0	ì			
Mc Gumbon Flot and		<del>,</del>		Ribes		C				macerient exposure and numerous Ribes at McCumber
Most transcript				roezrı	000	V	ı			1 0 + 1 0 m
the North Fork of Battle Creek	15	31M	SE	nevadense inerme	1 80 80	00	1 1	Miller Partington	11/8	Sugar pine only occasional.
Lassen				Pinus						ಕ
National Forest				lambert.	2,700	73	# 119			association in spots. The
	(			Ribes						aeciospores that infected
	100			roezli	915	2	ļ			the Ribes probably blew
Viola (Bailey	29,			nevadense	321	· — ·	1	Miller	1	
Creek)	22	31N	Œ	inerme	1,320	0	1	Partington	8/5	north end of the forest.
Plumes				Pinus	1	1				- + - F.G. +
National Forest	1		•	lambert.	1,100	01	11.			
South Branch of	27									٤.
the Middle Fork	20,			Ribes		:		r		ter rust incluence. Scout-
of the Feather	34-			roezli	1,500	144	1	Miller	700	ing generally poor except
River		22N	田/	7E nevadense	700	31	ı	Fartington	8/22	on these flats.

\*Some cankers had produced acciospores during the spring of 1941.

\*Cankers removed.

RECORD OF BLISTER RUST INFECTIONS FOUND IN CALIFORNIA DURING 1941

Stational Porest	1																											
ne Inspectors I I Miller Mille		Remarks			pine infection center on	down Fall River from the	tion on	alc		Good host	most places, however,	ıngs	Infection occurred on sugar	pine located on flats along	Lost Creek. The flats were	excellent sit	incidence of blister	tree located	the south end of a small	meadow.	Only a few Ribes and pines	present.	Infected bush found along	abandoned miners ditch	(Scale's Ditch). Forty-	three infected bushes were	located on ditch, however,	42 were pinyon rust.
ne kers		Date				76/8	2/2				8/15~	97				, , , ,	9/11-12					9/5					,	9/3
ne kers		Inspectors				Miller Partin <i>e</i> ton					Miller	Fartington				Willer	Partington			7	Miller	Partington					Miller	Fartington
Mational Forest   Roberts   Robert				1			T																	0		· · ·		
Mational Forest   Rocality   S   T   R   Species   Examined		Infect.		0		<b>4</b> 0		77			0 (		1	T >	,	9 6	0		~	(	0	0	,	0		r	-1 C	
Mational Forest   S T R Species	HOST	Examined		100	,	1,400		1,575			2,775	202	0	00)		1,500	150		315	9	800	92	(	150		7	00/2	200
A Mational Forest S T R  Plumas  Mational Forest Sutheast of Camel Forest Sutheast of Camel Forest Sutheast of Camel Forest Sutheast Suthe		Species	Pimis	lambert.	Ribes	roezli, nevadense	Pinus	lambert.	í	HI Des	roezli	Di mi c	1 11105	ramber.	Ki bes	roezli	nevadense	Pinus	Lambert.	El Des			Pinus	Lambert.	ر د ر د د د د د د د د د د د د د د د د د	ri bes		Me vaucitaci
Mational Forest  Fall River southeast of Camel Peak Plumas  Mational Forest  Mational Forest  Mational Forest  Iost Creek 28 21M  Rational Forest  Mational Forest		떮										4-					4					_						- 6
Mational Forest and and board and board break and beak beak blumas hational Forest beak blumas hational Forest blu		E⊣				221					2					2	77				0	NO P					2011	
Mational Forest and Fall River south- east of Camel Peak Plumas National Forest National Forest Plumas A Cascade D Plumas Hational Forest Rational Forest Plumas Mational Forest Plumas Ravine		Ω				37			1,	7=	, C					20	07				C	7					10	June
Value SAMUIY AHREIS &	Mational Forest	and Locality	Flumas National Forest		Fall River south-	east of Camel Peak	Plumas	wattonar rorest			Cascade	Plumas	Mational Honort	ימינים דסווסדי		Toot Crook	LOSU CIEEK	Flumas Matienal Ware	rantor rancest		Sly Crook	Dlumon	National Forest			Hard Gravel	Ravine	e cankers had nro
	λ.	qunoo								S		+	J '	I	ď		··-							AЯ	EЪ			*Som

cankers had produced aeciospores during the spring of 1941.

#Carlcers removed.

#### PART VI

BLISTER RUST CONTROL RECONNAISSANCE

By

Douglas R. Miller, Associate Forester

## INTRODUCTION

A reconnaissance party consisting of the project leader, six ERA men, and a cook began taking sugar pine and Ribes data on the Minersville unit of the Trinity National Forest, California, during the last week of May. This work was discontinued on June 30, as funds were no longer available. There was some pine counting done by the Forest Service on the Plumas National Forest of California and on the Umpqua National Forest of Oregon. The Oregon and California Revested Lands Administration also collected sugar pine data on the Siskiyou National Forest of Oregon.

# LOCATION AND DESCRIPTION OF AREAS

Reconnaissance work was started on the southern end of the Minersville unit on the Trinity National Forest. This area lies along the Weaverville-Trinity Center road and is in the northeastern portion of the forest. It ranges in elevation from 2,200 feet in the valley to over 5,000 feet along the slopes of Granite Peak and is drained by the Trinity River and its Stuart Forks. The sugar pine, which enters the timber stands on the slopes, is of fair quality and grows in association with Douglas fir and Ponderosa pine. Much of the area supporting sugar pine type has a ground cover of brush and tree reproduction (light to medium density) under the mature stand. Ribes are few in number and are confined almost entirely to the valley floor and to stream bottoms. Ribes cruentum and R. nevadense were the only specie found on the area covered by reconnaissance.

Pine counts on the Plumas National Forest were taken on the borders of or between existing control units, general descriptions of which have appeared in previous annual reports.

Some pine counting was done on the Coffee Pot and Straight Creek units, drained by the South Fork of the Umpqua River, at the southern end of the Umpqua National Forest of Oregon. In most cases there is only enough sugar pine present in the Douglas fir stand to warrant typing, but the individual sugar pine trees are of good quality. There is little brush present under the timber stand. Ribes are generally scarce except on rock outcrops and along streams. The species found on the two units are R. sanguineum, R. lobbii, R. cruentum, and R. lacustre.

There were also some pine counts taken in the vicinity of Soldier Camp (Bunker Hill Mine) on the Galice District of the Siskiyou National Forest of Oregon. Here sugar pine is associated with Douglas fir, white fir Ponderosa pine, and with Port Orford cedar on the moister sites. Although Ribes sanguineum, R. lobbii, R. bracteosum, and R. cruentum are present,

the Ribes population is generally light even along the streams. Brush is of medium to heavy density. The unit is drained by Silver Creek, a tributary of the Illinois River.

## METHODS OF WORK

The methods used in the regular reconnaissance work were similar to those used in the past. Compass and pacing were used to determine direction and distance for the four strips which were run per section. Ribes data were taken on a continuous strip as in advance checking, but were recorded by five-chain transects; timber data were taken on one-tenth acre circular plots at ten-chain intervals along the course of the strip. A type map and a brush density map were also made. Sugar pine data were recorded by the following size classes; trees less than six feet high, trees six feet high to 3.5 inches DBH, trees 3.6 inches DBH to 11.5 inches DBH, and trees 11.6 inches DBH and over. Typing this year was based on actual tree counts on the timber plots rather than from observation as heretofore used. The combinations of size classes which constituted type for a tenth-acre plot are as follows:

		SIZE (	CLASSES	
Combination Number	061	6'- 3•5"	3.6"- 11.5"	11.6"+
1	15	44	_	_
2	12	1	1	-
3	8	2	1	-
4	4	3		-
5		4	-	_
6	***	-	1	-
7		_	-	1

Areas were typed as sugar pine mature, non-sugar pine mature, sugar pine cutover and non-sugar pine cutover, and the data for each type were recorded in a separate box on the data sheet.

Sugar pine counts conducted on the various forests were taken on from four to eight strips per section and data were taken continuously throughout the length of each strip. The size classes used were, for practical purposes, the same as those described for reconnaissance. In some cases only general information on Ribes and brush was taken in addition to the sugar pine count.

#### WORK PERFORMED AND RESULTS OBTAINED

Blister rust control reconnaissance data were taken on 15,680 acres on the Minersville unit of the Trinity National Forest. Of this acreage, 10,080 acres which averaged 244 sugar pines per acre were classed as sugar pine type; and 5,600 acres which averaged only 21 sugar pines per acre, were classed as non-sugar pine type.

Sugar pine counts were taken on about 23,000 acres on the Plumas National Forest by the U. S. Forest Service. The Forest Service also took a pine count, in conjunction with a timber survey, on 11,758 acres on the Umpqua National Forest of Oregon. A special report of the Forest Service covers this work. The Oregon and California Revested Lands Administration took sugar pine counts, in conjunction with a Ribes survey on 9,082 acres on the Siskiyou National Forest of Oregon.

Table 1 gives the sections and acreages that were covered by the reconnaissance party on the Trinity National Forest.

Table 2 is a summary of the data taken by the reconnaissance party and is compiled by the two timber types that were present. The Ribes were extremely light on this area, as an average of only one bush per acre was found.

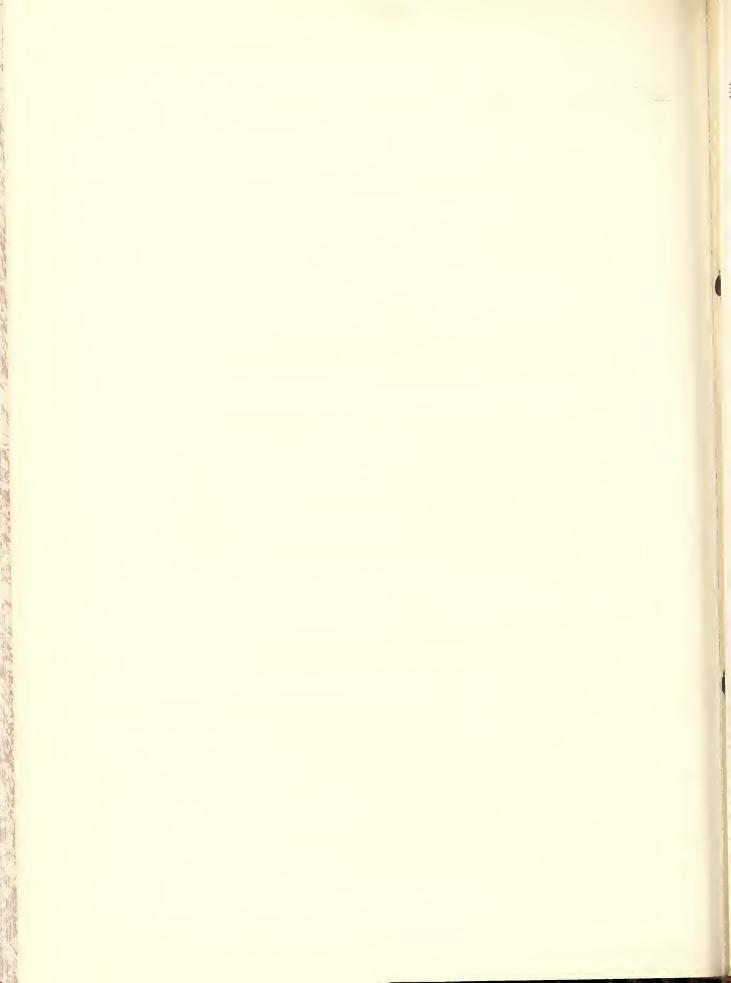
# LOCATION OF AREAS COVERED BY RECONNAISSANCE ON THE ON THE TRINITY NATIONAL FOREST, CALIFORNIA 1941

			Tot	als
Township	Range	Section by Number	Sections	Acres
34 N	8 W	5-9, 17-20	9	5,760
34 N	9 ₩	1,2,4,10-15, 22-24	12	7,680
35 N	9 ₩	<b>33–3</b> 6	4	2,240
	Tota	11	25	15,680

TABLE 2

SUMMARY OF RECONNAISSANCE DATA FROM THE TRINITY NATIONAL FOREST, CALIFORNIA- 1941

	<del></del>			PER	ACRI	3	
		St	ıgar Pir		ze Classes	3	
Timber Type	Acres	0-61	6'~ 3•5"	3.6"- 11.5"	11.6"+	Total	Ribes
Sugar Pine Mature	10,080	176	56	g	14	244	0.9
Non-Sugar Pine Mature	5,600	17	14		_	21	1.2
Total and Averages -	15,680	121	38	5	3	167	1.0



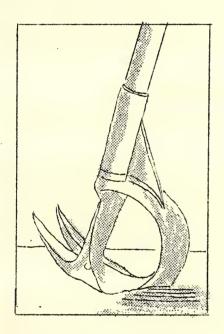
#### PART VII

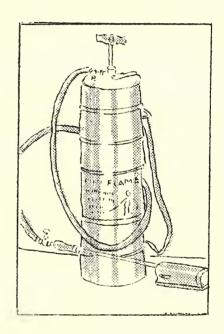
# RIBES ECOLOGY AND METHODS DEVELOPMENT IN THE SUGAR PINE REGION FOR 1941

By

Clarence R. Quick, Associate Forest Ecologist, Lawrence P. Winslow, Agent, and Harold R. Offord, Pathologist

Section 1 - RIBES ECOLOGY





The progress report for 1941 on Ribes ecology in the Sugar Pine Region will be organized under the following headings:

- 1. Cow Creek Ten-Acre Regeneration Plot
- 2. Seedling Occurrence on Eradicated Areas
- 3. Seedling Survival and Growth on Eradicated Areas
- 4. Occurrence and Growth of Ribes on Burns
- 5. Regeneration on One-Acre Plots
- 6. Seedling Occurrence and Survival in Grazing Exclosures
- 7. Fruiting of Seedling-Origin Bushes
- 8. Cross- and Self-Pollination of Ribes roezli
- 9. Ribes Regeneration Key

Serial Report No. 112 of the Berkeley Laboratory, "Manual for Care of Ribes Ecology Plots in the Sugar Pine Region," dated October 8, 1941 will answer questions concerning methods used in Ribes ecology work. An outline list of all plots in the current Ribes ecology program in California is a part of this serial report.

The several square-chain Ribes regeneration plots in dense brush, last considered in the 1940 report, were not inspected in 1941, and consideration of them is omitted from this report. The next planned inspection of these plots comes in 1943.

This past season the writer had no field assistant subsequent to the first of July, and as a result almost no new plots or studies were started. All previously initiated plots were continued.

Previously submitted material on the plots or the study concerned is cited in the present report immediately under each of the section headings. Also, in the 1940 Annual Report a "status of study" summary was given for topics 1-5 and for topic 8 listed above. These summaries will not be repeated in this report. It is hoped that brevity without undue loss of clarity is thus obtained.

# 1. COW CREEK TEN-ACRE REGENERATION PLOT

For a summary report on this plot see the annual report for 1940, pp. 126-130 and 132-136.

This plot was logged in 1923 and has since become progressively more brushy. It has been fenced since 1927. For several years there have been very few Ribes seedlings surviving on this plot through the first summer. As far as the common pioneer species of Ribes are concerned, the vegetation appears to be practically mature over almost all of the plot, and the writer has ventured the opinion that no Ribes seedlings need survive subsequent to, and as a result of, Ribes eradication of such an area.

Ten square-chain subplots (Nos. 20, 30, 36, 40, 45, 59, 61, 64, 83, and 84) were selected in 1938 for detailed annual inspection. In 1941, ten additional subplots were selected, and the resulting list of twenty subplots divided into two groups of ten subplots each. One group of subplots (Nos. 6, 36, 44, 46, 58, 59, 65, 77, 83, and 97) was eradicated on May 21, 1941, of all known Ribes, and carefully inspected for previously unknown Ribes. The writer did the eradication work with the usual small pick-mattock. Care was taken, however, to cause as little disturbance as possible to other vegetation and to the soil. A second group of subplots (Nos. 20, 30, 40, 45, 61, 62, 64, 78, 84, and 96) was carefully inspected on June 3, 1941, for all known and previously unknown Ribes. Data were recorded for each bush found but no Ribes were eradicated. In the future it is proposed to check annually both groups of these twenty selected subplots.

Tables 1 and 2 record the data collected in 1941 from these twenty subplots.

The two groups are reasonably similar, and in the years to come should furnish a comparison of the effects of careful and thorough hand eradication on areas covered with vegetation which, though not silviculturally mature, appears to be mature as far as the pioneer species of Ribes are concerned. In the future it is expected that, aside from local severe disturbances to the vegetation and soil, few or no Ribes seedlings will normally be able to become established on either the eradicated or the uneradicated subplots.

# 2. OCCURRENCE OF CURRENT SEASON SEEDLINGS ON ERADICATED AREAS

For previously submitted material see the annual report for 1940, pp. 131 and 137.

Table 3 reports the CSS (current season seedlings) removed from the several plots of this series in the spring of 1941.

The average seedlings per milacre reported in the lower part of Table 3 show that conditions other than time since eradication (and last fruiting) of parent bushes are of importance in the occurrence of current season Ribes seedlings on eradicated areas. When additional data have been collected, an attempt should be made to correlate seedling occurrence with other factors, such as season precipitation, length of summer-drought, winter temperature indices, grazing intensity, etc. At present the data have not been recorded over a sufficiently long period to indicate anything more than trends.

Of especial interest are (1) the almost complete lack of CSS during the past two years on the Markwood Meadow milacre plots, (2) the steady and rather rapid decline of CSS on the Chowchilla Mt. plots, and (3) the steady increase for the past two years of CSS on the Cow Creek milacre plots.

# 3. SEEDLING SURVIVAL AND GROWTH

For previously reported material see the 1940 annual report, pp. 138 and 140.

Three small plots (30 milacres total) near Spring Garden, Plumas operation, were added to this study during 1941.

# Spring Garden Milacres

These three small plots (I, II, and III) are located in the SW 1/4 of the NE 1/4 of Sec. 35, T. 24N., R. 10E. They were established on a heavily logged, badly disturbed, second-rate forest site on the Thompson Creek unit of the Plumas operation on July 31, 1941. The following notes, taken at the time of plot initiation, will help to explain conditions on the area. Timber: residual from relatively heavy logging; Douglas fir, cedar, black oak, white fir, sugar pine, and yellow pine; many snags pre-date logging. Vegetation: thin; on immediate plot area practically lacking because of logging disturbance. Herbs: scarce; clover, hawkwood, Gayophytum, etc. Shrubs: thin to scarce; black oak, waxberry, manzanita, service berry, squaw-carpet, ground rose; a very little deerbrush and snow brush. Soil: thin, apparently poor, floury-pebbly, and rocky; from metamorphic rocks. Soilwater: very scarce, due perhaps largely to shallow rocky soil. Slope: gent. southerly. Use: logged in 1940; much caterpillar tractor disturbance to

vegetation and soil; some post-logging cutting of firewood; no grazing signs apparent (little or nothing for cattle to eat).

The area, although logged in 1940 with much disturbance, blocked out as sufficiently Ribes-free in 1941. Very few Ribes, either old bushes or seedlings, were found. Only two Ribes seedlings were found growing on the 30 milacres of the severely disturbed plots. A remarkably large number of Ceanothus (deerbrush and snowbrush) seedlings were appearing on the plots, in contrast to the few mature bushes in the relatively undisturbed adjacent timber. The general aspect of the area is one of aridity. The dryness is due chiefly to the shallow rocky soil which cannot hold soil moisture through the summer. The area is also in somewhat of a rain-shadow from the higher mountains to the west.

Table 4 lists the seedlings and resprouts of perennial plants that were found on the Spring Garden plots at initial inspection.

Table 5 records the size and age distribution of Ribes found in 1941 on several small plots, including in addition to seedling-survival and growth-rate plots some of the burn plots. To the writer, the outstanding item from Table 5 is the small average size of Ribes bushes, and the paucity of fruiting plants on several of the plots represented. Some of the plots in this Table, for example the Cutler Meadow plots, will be later considered in more detail.

Table 6 reports, for sundry plots, the occurrence of CSS in 1940 and 1941, and the survival of CSS in 1940 to one-year-old seedlings in 1941. For convenience the last series of plots (Cow Creek A, B, C, and D) are placed in this Table rather than in Table 3. From plots A, B, and C all the CSS are removed as found. On the Cow Creek 1.6-acre plot the CSS are estimated and left on the plot at time of check, while the one-year-olds are removed and counted with hand tallies. The estimations of CSS on this plot seem to have been consistently low. This makes the 1940-1941 survival appear higher than it actually may have been.

Table 7 summarizes for the two Butt Creek plots the relation between age and size of seedlings and seedling-origin bushes. This Table emphasizes the relative unfruitfulness and the relative slowness of growth of Ribes plants on certain sites. The Butt Creek site, while not particularly good for Ribes growth, once supported a large population of vigorously fruiting bushes. Additional data for comparison with these figures should be collected in other localities within the Sugar Pine Region.

# 4. REGENERATION OF RIBES ON BURNS

For previously submitted material, see the 1940 annual report, pp. 139 and 141.

Two small plots (20 milacres each) near Cutler Meadow, Thompson Creek unit, Plumas operation, were added to this study during 1941.

#### Cutler Meadow Burn Plots

These two small plots (I and II) are located in Sec. 4, T. 23N., R. 10E., along the Quincy-LaPorte road where it crosses a divide just west of Cutler Meadow. This divide is about 5.1 miles southerly from the LaPorte road turnoff on State Highway #89, a few miles east of Quincy. The two plots are located on different exposures, and will consequently be described separately. The following brief notes will help to visualize conditions on the plots.

Plot I - Vegetation: Dense immature shady forest with considerable small reproduction and brush prior to burn; now a black thick-snaggy incipient brush patch. Associated conffers: All dead; white fir, douglas fir, sugar pine, cedar, yellow pine. No conifer regeneration observed.

Associated shrubs: Resprouting ground waxberry, dogwood, black oak, willow, service berry, thimble-berry, and ground rose. Seedling regeneration of deerbrush (very dense on plot), snowbrush, gooseberry, manzanita, and bearbrush (Garraya). Soil: Loose, friable, rather deep, well-drained; from metamorphic rocks. Slope: Medium northerly. Use: Hot burn (all conifers killed on or near plot) in summer of 1939. No logging on immediate area. No grazing evidence noticed; but probably in grazed area.

The outstanding item of interest was the density and vigor of the deerbrush seedlings (Ceanothus integerrimus) on the northerly-facing slope. No charred remains of old deerbrush, snowbrush, or manzanita bushes were observed in the vicinity of the plot.

Plot II - Vegetation: Thin open forest prior to 1939 burn. Burn partial; killed all conifer reproduction, and some but not all of mature conifers. Associated conifers: White fir, douglas fir, sugar pine, and cedar. Associated shrubs: Resprouting ground waxberry, rose, thimble-berry, willow, dogwood, and service berry. Numerous seedlings of snowbrush, deerbrush, and gooseberry. Soil: deep, friable, well-drained. Slope: Plot crosses ravine; northeasterly, and southeasterly. Use: Burned in summer of 1939; had just previously been logged. Probably grazed, but no evidence thereof observed.

The immediate area of this second plot was very uneven as to severity of burn. In some spots the duff was incompletely burned, in other spots only mineral soil was left. Most of the gooseberry seedlings were found on caterpillar tractor disturbances. Gooseberries along the roads and in disturbed spots were of very rapid growth, but were not nearly so numerous as on Plot I. Prior to the fire the vegetation was apparently rather thin, in distinct contrast to the dense vegetation on Plot I prior to the burn.

Table 5 (already presented) includes data from these and other plots on burned areas.

Table 8 summarizes the data collected in 1941 from some 400 seedling origin Ribes plants staked on the burned (and annually inspected) part of the 5.6-acre Cow Creek plot. The criterion for staking a Ribes seedling for this study was whether or not that seedling seemed to be more or less permanently established at the time of staking. It is to be expected, therefore, that the average bush size by year of staking decreases rather consistently. For some

reason not readily apparent the 1938 origin seedlings have not grown as rapidly as the 1939 origin plants.

Thirty-seven of the 399 staked bushes in this study flowered for the first time in 1941. The fruiting of these plants and of other seedling-origin Ribes will be considered in detail later on in this report.

A small burn occurred on another portion of the 5.6-acre plot in the fall of 1940. In 1941 this spot burn, with an area of roughly 1/4 square chain, was tentatively selected as a plot. One partly burned mature Ribes roczli bush persisted on the area. In June of this year, 65 CSS Ribes were counted. On July 12, only 19 CSS were found, and on August 13, 18 CSS were found. If time and opportunity permit, this plot will be continued.

# 5. ONE-ACRE REGENERATION PLOTS

For previously submitted material see the 1940 annual report, pp. 143-145 and 147-149.

This study has been considered in some detail in past years. Only a brief progress report will be presented at this time.

Table 9 records the results of the 1941 inspections of these one-acre plots. Logging was in progress on the Shaver Timber plot, Sierra operation, at the only time this year when the writer could be in that vicinity, and no Ribes data were collected.

It is apparent again that data concerning Ribes populations on plots such as these, obtained from the second inspection subsequent to eradication, are much more trustworthy than are data from the first inspection following eradication. Both the Blue Canyon plot and the Fanianni Timber plot were inspected last year immediately following eradication. Data from this year's inspection of these plots show many more bushes, and much more live stem than were found last year. Time of year, type of season, and period since eradication, are obviously to be considered, but still other important and unidentified factors may also be involved. On the seven acres (total area) there were 623 Ribes, of which 125 had three or more feet of live stem, and 14 had 12 or more feet of live stem.

# 6. GRAZING EXCLOSURES AND COMPARISON PLOTS (CONTROLS)

For previously submitted material, see the 1940 annual report, pp. 150-153.

The plots of this series, reported in detail and for the first time in 1940, were inspected twice during 1941, (1) in the spring when the CSS were vigorous, and (2) in the fall after the long dry period of the summer had been broken by rains.

Table 10 reports the Ribes CSS found on the plots in the spring and in the fall, and the percentage survival of seedlings from the spring to the fall.

Table 11 records data on the size of Ribes seedlings found on the exclosure plots in the fall.

Compilations of data concerning the survival and growth of these 1941-origin Ribes, and the occurrence, survival and growth of Ribes appearing subsequently will be of considerable interest.

The current indications are that there is higher seedling survival on oil eradicated subplots than on hand eradicated subplots, and higher seedling survival on subplots inside the fences than on outside subplots. Survival appears to vary rather widely with plot. Additional years of data will be necessary, however, before useful generalizations can be drawn.

The growth of CSS on these plots during 1941, as shown in Table 11, was decidedly slow. In the fall, out of some 1940 surviving seedlings, only 12 had four or more inches of live stem. This may be partially explained by the fact that all the grazing plots have been established on areas of relatively old disturbance.

# 7. FRUITING OF SEEDLING-ORIGIN RIBES BUSHES

For previously submitted data see the 1940 annual report, p. 138 (Plot G), and the 1939 annual report, p. 148.

A total of 222 fruiting Ribes roezli bushes was removed from plot G (24 milacres area) Chowchilla Mt., Sierra operation, on June 27, 1941. Of these bushes 19 were estimated to be of 1935 origin, 84 of 1936 origin, 114 of 1937 origin, and 5 of 1938 origin. Other items of data from this plot for 1941 are: total estimated live stem removed, 1940 feet; average live stem per removed bush, 8.75 feet; total estimated green fruits borne by the 222 removed bushes on June 27, 1,516 fruits; and average per bush, 6.8 fruits.

Table 12 reports the relation between **si**ze of bush and number of green fruits on the 222 removed bushes.

Table 13 reports data on size and growth rate of first-fruiting Ribes roezli bushes removed in 1940 and 1941 from certain small growth-rate plots, and may be compared with Table 7 (p. 148) of the 1939 annual report.

Table 14 records the data collected from 37 seedling-origin Ribes, and from three old pre-burn Ribes, fruiting in 1941 on the burned portion of the 5.6-acre Cow Creek plot. None of the included seedling-origin bushes had fruited previously.

The ratio of fruits matured to flowers produced is surprisingly low. Only 2.1 percent of flowers developed into mature fruits, and only 20 percent of the flowering bushes eventually produced ripe fruits. None of the flowering seedling-origin bushes with only "fair" vigor, and none of the older pre-burn bushes, produced mature fruits. Only 26 percent of seedling-origin bushes with "good" vigor, and only 35 percent of bushes with "excellent" vigor produced ripe fruits.

Additional data from this plot and similar data on flowering and fruiting from bushes in several other habitats will be collected as time and opportunity permit.

TABLE 1 - COW CREEK TEN-ACRE PLOT, SUMMARY OF RIBES

Eradi-	Bush	nes	S		istrib					es,		nts of , Linea	Ribes ar Feet
cation Sub- plot Number	Dead and Staked	<u>l</u> / Newly Found		2- 5•91	6- 15.9'	16- 40'	41- 100'	101- 500'	501' and Over	Total Bush- es	Total Live Stem	Total Dead Stem	Average Live Stem Per Bush
6		2		2	<b>6-4</b>	5	_	_	2	9	1,450	1,353	161
36		1	2	1	1	1	3		_	7	247	101	. 35
44	-	2	-	3	2	3	_	-	-	g	100	104	13
46	1	3	1	4	<b>9-4</b>	ĵ†		-	·	9	108	183	12
58	_	g	4	4	3	3	1	1		16	408	485	26
59	2	5	2	7	6	8	3	2	-	28	771	416	28
65	<b>-</b>	. 6	2	· l	3	4	3	1	-	14	568	519	41
77	1	2	-	2	5	2	3	-		12	324	739	27
83	2	1	-	2	5	_5	2	1	-	15	533	901	36
97.3/		_	1		1.	1	3	-	-	6	246	223	41
Totals	6	30	12	25	26	36	18	5	2	15/1	4,755	5,024	42.0
Per- cent- ages	-	-	10	20	21	29	15	4	2	101		-	-

<sup>1/</sup>Mostly layers and intertwined parts of bushes already known and staked.

<sup>2/</sup>The two associated species competing most closely with each Ribes bush have been tabulated.

Abbreviations for which are as follows: AP - Manzanita; CC - Snowbrush; CF - Bea Clover; CI - Deerbrush; LDR - Cedar reproduction; SL - Willow; SM - Waxberry; and WFR - White Fir Reproduction.

<sup>3</sup> One bush in this subplot was Ribes cereum. All other bushes on the ten subplots were R. roezli.

# ON TEN SELECTED ERADICATED SUBPLOTS, MAY 21, 1941

Vi	(	of Bus		Very		Flower-			Mo s	st 1 Per	enni	tar als	s of	Assoc Liv	ciated	
Excel.	Good G	Fair F	Poor P	Poor VP	Totals T	ing Bushes	AP	cc	CF	CI	1		1	WFR	Other	Totals
							<u>L</u>							<u> </u>		
2	-	5	2	-	9	6	3	12	3	-	-	-	-	-	-	18
1	3	2	1	•••	7	5	2	5	-	-	-	-	4	2	1	14
-	1	2	5	•	8	5	-	4		-	14	-	1	7	-	16
-	2	4	3	0=0	9	6	2	2	8	1	1	-		1	3	18
•••	1	12	3	-	16	6	5	6	15	3	1	_	-	2		32
1	4	12	11	-	28	20	7	12	24	-	4	5	2	2	-	56
. 1	2	8	3	-	14	10	5	14	9.	-	4		=.	-	6	28
-	1	7	2	2	12	7	4	4	9	1	2	-		1	3	24
<b></b>	2	6	5	2.	15	14	10	2	9	1	4	_	2	-	2	30
-	1	3	1	1	6	5	3	-	5	_	1	_	1	_	2	12
5	17	61	36	5	124	814	41	51	82	6	21	5	10	15	17	248
4	14	49	29	4	100	68	17	20	33	2	8	2	14	6	7	99

TABLE 2 - COW CREEK TEN-ACRE PLOT, SUMMARY OF

Un- Eradi-	Bush	<b>e g</b>	Size		ributi otal F					shes,	l		Ribes ar Feet
cated Sub- plot Number	Dead and Staked	Newly		2-		16-			501 and Over	Total Live Bush- es	Total Live Stem, Feet		Average Live Stem Per Bush
20		-		2	. 2	5	3			12	352	155	29
30	1			1	3	1			-	5	52	24	10
40			-		4	2		1	1	g	1,122	511	140
45				-	1	14	2	1		g	408	90	51
61			-	3		3	2	1		9	398	117	1414
62		2	2	1	l	14		-		g	121	317	15
642/	1	1	1	1	11	6	4	3		26	1,066	565	41
78	1	7	3		3	5.	<u>-</u>	2	_	13	454	922	35
84		1		4	1_	Ţţ	1	2		12	512	809	43
96	1	-	_	1		3	-	1	-	5	197	619	39
Totals	. 4	11	6	13	26	37	12	11	1	106	4,682	4,129	44.7
Per- cent- ages	_		6	12	25	35	11	10	1	100	-	-	-

The two associated species competing most closely with each Ribes bush are tabulated.

Abbreviations as follows: AP - Manzanita; CC - Snowbrush; CD - Prostrate ceanothus; CF - Bear Clover; CI - Deerbrush; LDR - Cedar reproduction; PA - Bracken; SM - Waxberry; and WFR - White Fir reproduction.

Two bushes on subplots 40 and 64 were Ribes cereum. All other bushes on tensubplots were R. roezli.

# RIBES ON TEN SELECTED UNERADICATED SUBPLOTS, JUNE 3, 1941

Vi	suall;	y Est: f Busl		d Vigo		Flower-		Ī			enni	rtan lals	of		ciate	ed L/	
Excel	Good G	Fair F	Poor P	.Good VP	Totals T		AP	CC	CD	CF				SM	WFR.	Other	Totals
		5	7	_	12	10	Ъ.	10	-	9	_	1	-	-	<b>**</b>		24
-	-	-	5		5	3	4	5	-	-	-			-		1	10
-	2	3	3	-	8	5	-	g	-	1	2	_	5		1		16
_		14	14		g	g	3	5	1	-	-	_	3	2		2	16
-	3	14	2	••	9	7	1	3	<del>-</del>	14	-	5	_	-	5	3×3	18
_	_	5	3	-	g	4	3	5		8	-	_	gang	-	-		16
_	1	6	19	-	26	18	5	23	-	16	6	p==0	_	_	1	1	52
_	-	9	4	-	13	4	1	8		10	1	2	_	1	_	3	26
_	1	1	9	1	12	7	-	2	-	9	_	11	_	1	_	1	5 <i>j</i> t
	1	_	3	1	5	3	1	_	5	1	_	-	_	_	_	3	10
0	g	37	59	2	106	69	22	69	6	58	9	19	g	14	6	11	212
0	8	35	56	2	101	65	10	33	3	27	4	9	4	2	3	5	100

TABLE 3

SUMMARY OF CURRENT SEASON (1941-ORIGIN) RIBES SEEDLINGS FOUND ON SEEDLING OCCURRENCE PLOTS IN SPRING OF 1941, WITH COMPARISONS WITH OTHER YEARS

Spanish Ranch Ridge Wilacres,	Plumas Mational Forest 6/9/41	28	22	8		121	5	153	157	17,	13	1	•	507	[5]	Ĺ	33 17	91	μο 1/
Markwood Meadow Wilacres,	Sierra Mational Forest 8/6/41	0	<b>N</b>	_	0	0	0	0	0	~	2	1	-	7		0	58	1	•
Cow Creek Camp Site Wilacres,	Stanislaus National Forest 5/18/41	96	72	142	88	114	52	8	150	52	46	I	-	248	85	57	31	548	602
tain, Forest	Plot F 6/25/41	33	17,	55	27	5,7	35	26	89	18	54	50	31	904	34	107	128	75	657
illa Mountain, Kational Fores	Plot E 6/26/41	183	45	34	<u>.</u>	38	94	31	80	5	35	29	69	669	58	166	341	717	5021
wch	1939 Milacres 6/25/41	115	105	234	70	45	1	1	1	1	ı	I	1	569	114	121	2,0551	1	1
	1938 Milacres 6/25/41	27	23	121	297	210	16	18	38	0			1	1,051	105	233	209	5587	1
	Milacre	1	N	2	7	5	9	7	∞	5	10		12	Totals 1941		0†1 V	E R 139	-	E 37

1/First check; older bushes also removed at same time.

TABLE 4

SUMMARY OF VEGETATION FOUND ON SPRING GARDEN PLOTS

JULY 31, 1941

			Nu		of Se	nnial			sprou	ts			Total Perennial Seedlings
Milacre Number	AA	AP	CC	CI	CP	<sub>PT</sub> 1/	PE	QK	RP	RR	RS	SM	and Sprouts
1	-	_	1	13	7		_	1	-	-	3	1	25
2	-	-	1	12	-	-	-	-	_	_	-	-	13
3	-	_	1 1	8	-	l	_	-	-	-	-	-	10
4		-	1	22	-	-	_	-		-	-	4	27
5	-	-	-	7	-	-	-		-		3	_	10
6	-	-		7	-	2	-	_	-	-	-	***	9
7			2	. 27	-	540	1	-		_	4	-	34
8		1	5	22	1	-	-	-	-	_	4	2	35 16
99		1	3	12	-		-	-				-	16
10	-		2	7	-		-	<u> </u>		<b></b>	2		11
11			4	15		-	-	-	-		1	3 6	23
12	-		2	11	~	1	-		_		2		22
13	-	6	14	15		1	-	-	-	-	-	1	27
14	_		1	16	-	-	-		-	1	-	7	25
15 16	1	7	3	15	-	1		1		<b>-</b>	-	2	30
16	-	-	2	10	25	1		1		-		10	49
17			7	17		5					-	10	39
18	_	10	<u> </u>	32	-			-	-		-	1	50 36
19	J7	4	5	17		1	2		-		-	-	36
20	6	-	2	6	]1	2	<del>-</del>				-	ļ	17
21		2	¥ 8	12	-	1 2					ļ <del>-</del>	-	19
22		<b>-</b> 3	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	22 16	1		, <del>-</del>	-	-		-	=	33
23 24	-	9		31		1			1.,.1				25 44
25	-		2	1	2	1	-	-		1		-	6
25 26	_		3		1	2	-						9
27	-		9	3	_ <u> </u>	1			- <u>-</u>	-			10
28	-	-	2	1 2	1	-			ΙΞ	<u> </u>		2	7
29	-	<u>-</u>	1	3					_	_	-	-	5
30	-	1	1		1	-	-	-	_	-	3	-	56
Totals	14	45	89	382	40	23	3	2	<del>i</del> i	2	22	149	672

Probably includes some white fir seedlings as well.

N.B. - List of abbreviations: AA - Amelanchier alnifolia (Service Berry);

AP - Arctostaphylos patula (Greene's manzanita); CC - Ceanothus cordulatus
(Snowbrush); CI - Ceanothus integerrimus (Deerbrush); CP - Ceanothus prostatus
(Squaw carpet); PE - Prunus emarginata (Bitter cherry); PT - Pseudotsuga
taxifolia (Douglas fir); QK - Quercus kelloggia (Black Oak); RP - Rubus parviflorums (Thimble-berry); RR - Ribes roezli (Sierra Nevada gooseberry); RS - Rosa
spithamea (Ground rose); SM - Symphoricarpos mollis (Ground waxberry).

TABLE 5 - SIZE AND AGE DISTRIBUTION OF RIBES BUSHES FOUND

						Size D	istr	but	ion of
Lines of Data	Plot Locality and Forest	Plot Name	Acreage of Plot	Date of Check	0 4.9"	5 <del>-</del> 11.9"	12 <b>-</b> 35"	36 <b>-</b> 71"	
1	Butt Creek Plumas National Forest	I	•025	6/11	94	26	. 38	21	8
2		II	•024	6/11	175	43	27	15	9
3	Chowchilla Mt., Sierra National Forest	G	.024	6/27		-	5	48	110
Ţŧ		D	•005	6/19	8	1	5	1	1
55	Cow Creek Stanislaus	5.6-Acre spot burn	•025 <u>1</u> /	8/13	16	2	1		-
6	National Forest	5.6-Acre staked plants 5.6-Acre	2.0 1/	7/11	22	96	126	65	46
7		subplots	•028	6/21	25	42	21	2	1
8		1.6-Acre	•970 <sup>1</sup> /	6/20	2/		-	=	
9	(C. E.)	Spot burn	.1501/	5/23	25	63	20	3	
10	Cutler Meadow Plumas	I	•020	7/28	287	290	255	49	7
11	National Forest	II	.020	7/31	17	14	30	18	4
12	Spring Garden Plumas National Forest	I, II,	•030	7/31	2	-	-	-	

Approximate size.

<sup>2/</sup>This series of data not recorded.

# ON SUNDRY SEEDLING SURVIVAL AND GROWTH RATE PLOTS IN 1941

Ribe	s Bush	nes Fou	nd		Age Di:	stribut		Ribes B Years	ishes Fo	ound (	on
121-	25 and Over	Total Bushes	Fruit- ing Bushes	0 CSS (1941)	1 (1940)	2 (1939)	ス	4 (1937)	5 (1936)	6 and Over	Total Bushes
6	_	193	3	68	g	16	57	18	21	5	193
14	1	274	-	111	7	28	93	18	4	13	274
59	-	222	VII	-	-	-	5	114	34	19	222
	-	16	2	g	-		3	2	2	1	16
	_	19	***************************************	18	_	-	-	-	-	1	19
17	5	3 <b>7</b> 7	37	<b></b>		13	57	307	<b>5-4</b>	-	377
<b>0</b> 0	-	91	2	_	<b></b>	4	13	74	-	-	91
	_	_	_	1,165	308	147	61	8	1	1	1,691
_	-	111	-	-	-	1	108	2	-	-	111
	-	888	-	-	888		-	_			888
3	_	86	-	9	77	-	-	-	-	-	86
-	-	2	-	2	-	-	•••			-	2

TABLE 6

SURVIVAL OF RIBES SEEDLINGS THROUGH FIRST YEAR FROM SEED, 1940-1941:
AID OTHER 1941 SEEDLING DATA

Plot Locality and Forest	7lot Name	Subplot	Plot Area	CSS <sup>1</sup> / Found Spring 1940	One-year- olds Found Spring 1941	Percent 1-Year Sur- vival	CSS Found Spring 1941	Percent 1941-1940 Seedlings
Butt Creek Plumes National Forest	 	1 1	25 Wilacres 24 Wilacres	192	8 7	14.2	68	35 58
onovenilla mv., Sierra National Forest	F3 F4	1 1	12 Milacres 12 Milacres	1,280	53	2.6	699	55
Cow Creek Stanislaus Wational Forest	1.5-A do do do . do .	I II IV V V	.06 acre .21 acre .30 acre .20 acre	40 520 530 465 135	8 95 95 88 88 88 88 88 88 88 88 88 88 88 88 88	20°0 18°0 1775 173°0 173°0 173°0	155 155 155 155	575 888 55 111 55 69
Cow Creek Stanislaus National Forest	4 W O A	1 7 1 1	30 Milacres 28 Hilacres 21 Milacres 5 Milacres	105 394 269 11	1 1 10	1 1 10	184 172 879	175 120 194 73

1/CSS - Current season seedlings.

TABLE 7

RIBES SIZE AND AGE DISTRIBUTION OF BUSHES FOUND IN 1941 ON BUTT CREEK SEEDLING PLOTS, PLUMAS NATIONAL FOREST

Estimated Year of		Estima			s Bushes ear Live	•		
Bush Origin	0-4.9"						25 and Over	Total Bushes
	.3U:	IT CREEK	I (25 1	MILACRES	5, OR 1/1	+O ACRE)		
1941	68	-	-	-			-	68
1940	7	1	-		-		-	8
1939	8	7	1	-	-			16
1938	7	13	23	12	1	1	-	57
1937	2	5	7	3.,	<b>-</b> - ,	1,,		18
1936 1935	ļ <u>ļ</u>			5.=/	5±1	34		21
	<u> </u>		-	1	2		-	5_
Total Bushes	94	26	38	21	g	6	_	193
	BUTT	CREEK I	I (24 M	ILACRES	OR ABO	UT 1/40 AC	RE)	
1941	111	-	_	_	-		-	111
1940	6	1	_		***	<b>-</b>	-	7
1939	14	13	1		-	-	-	28
1938	44	28	15	6	-			93
1937	-	<u> </u>	<u>р</u>	4	5	21/		18
1936		***	<u></u>	2		1. —	-	4
1935 1934	_		4	2		7		7
1933	_	-		~	-		1	1
Total	<u> </u>			i i				1
Bushes	175	43	27	15	9	<u>1</u>	1	274

<sup>1/</sup>One bush in each of these categories fruiting, and removed from plot, all other Ribes nonfruiting.

TABLE 8

SUMMARY OF GROWTH DATA FROM STAKED SEEDLING-ORIGIN RIBES BUSHES ON BURN, 5.6-AGRE COW GREEK PLOT - JULY 12, 1941

Average Size of	Bushes	Feet of	Live Stem	8.9	3.1	0°†	2.7	3.1	3.6	1.3	6.0	1.4	1.2	0.7	0.0	7.0	7.0	7.5	0°0 N	0,0	3.8
Total	Live	Stem,	Feet	615.6	277-1	337.9	100.3	15.4	19.534	/ <sub>15.0</sub>	10.4	10.1	65.5	19.8	4.8	0.7	25.3	1,295.4	115.4	26.2	1,437.0
Total	Bushes	In	Series	1/2	101	88	38	O	132	36	12	∞	99	27	ರು	Н	36	326	58	15	399
	Staked	Dead	Bushes	5	11	3	Н	H	5	1	1	1	1	1	1	1	1	19	~	CI	22
	To tal	Live	Bushes	69	96	85	37	5	127	92	12	7	55	27	. t∞	1	36	307	57	1.3	377
덮		251 and	Over	5	1	ı	1	i	1	1	1	1	1	ı	1	- 1	1	5	1	1	5
shes in 1941	e Class		72-143" 121-24.91	6	3	3	2	1	5	1	1	1	1	t	1	1	1	15	N	î	17
Live Bushes	Per Size		72-143"	50	10	14	Н	1	15	г	1	1	П	1	1	1	1	45	H	1	94
Distribution of	f Ribes		35-71"	91	15	22	5	3	30	2	1	П	3	-1	1	1	1	1 26	ι.	4	99
istribu.	Number of		12-35"	14	33	36	16	2	54	12	5	7	21	2	) p{	1	14	86	22	9	126
Size D	N		5-11#	5	54	6	12	1	17	16	S	a	†2	17		-	22	7.1	22	3	96
· ·			10	1	5	Н	1	1	2	5	Н	1	9	9	3	1	6	17	ις	1	122
Year	of	Bush	Origin	1937	1937	1937	1938	1939	Totals	1937	1938	1939	Totals	1937	1938	1939	Totels	L	1938		Totals
Year	Bushes	Were	Staked	1937	1938	1939	1939	1939	1939	1940	1940	1940	1940	1941	1941	1941	1941	Totels	Totals	Totals	Grand

TABLE 9

DATA FROM RECHECKS MADE ON ONE-ACRE REGENERATION PLOTS DURING 1941 (DATA ARE ALL ON A PER ACRE BASIS)

Total Fruits	Pro- duced	1	1	09	t	21	1	1	82
Frui t-	ing Bushes	ı	1	0	t	2	I	r-1	12
on of	To tal	71	89	263	28	136	Ţ1	16	623
Species Distribution of Bushes	R. nev.	ŧ	ı	1	ı	ή8	22	ı	901
	R. roez.	71	98	263	28	52			517
Additional Small Unplotted Seedlings	Older Total	200	16	75	I	5713	1005/	I	362
Additiona 11 Unplot Seedlings	Older	1	1	16	l-	ı	ı	ı	1
Smal	CSS	200	16	59	ı	1	ı	1	1
	Total Bushes	7.1	88	263	28	136	14	16	623
of ted	12.1- 24.1	ı	۳	6	Н	2	1	ı	17,7
Size Distribution of Estimated and Plotted Bushes	72- 143"	1	Н	17	Н	#	ı	Н	7,7
stribu ed and Bushes	12- 36- 35" 71"	0	Ţ	39		19	#	Н	87
Dist ated Bu		28	25	95		54	7	12	227
ize	子 []	26	17			742	14	2	162
Ω EI	루	Ø	13	94	12		16	1	109
Estimated 1/	TLS	82	131	636	59	ť	38	35	- 461 799 1,260 109 162 227 87
Estimated Live Stem	css ors	39	`	176 460	31	$\vdash$	23		662
Es	css	43	43	176	28	131	15	25	194
Forest	and Plot Name	Sierra N.F. Blue Canyon	Sierra N.F. Pilot Peak	7/13 Signal Peak	7/23 Inter-Road	Plumas N.F. 7/24 Gentle Gully	Plumas N.F. Rock Creek	Plumas N.F. Fanianni Timber	Totals
1941 Date	of Che <i>c</i> k	9/8		7/13	7/23	47Z/Z	7/25	8/1	Ĥ

1 CSS = current season stem; OLS = older live stem; and TLS = total live stem.

2/No differentiation made between CSS and older.

TABLE 10

# PERCENTAGE CURRENT SEASON RIBES SEEDLING SURVIVAL, EXCLOSURE PLOTS, 1941

		1.1.		7		
			xclosure F			
Type			ates of In			
of	a	Chowchilla		Big Bar		Total
Eradication	Check	Mountain			Lake Almanor	of
and	and	6/25/41	6/18/41	6/6/41	6/10/41	All Four
Location	Percent	8/18/41	8/13/41	9/2/41	9/1/41	Plots
Hand Eradication	Spring	992	615	8 <i>j</i> t	519	2,210
Inside	Fall	426	189	17	73	705
Fence	% Survived	42.9%	30.7%	20.2%		31.9%
Hand Eradication	Spring	987	317	29	526	1,859
Outside	Fall	171	73	5	55	304
Fence	% Survived	17.3%	23.0%	17.2%	10.4%	16.4%
Oil Eradication	Spring	941	433	154	452	1,980
Inside	Fall	212	235	4g	42	537
Fence	% Survived	22.3%	54.3%	31.2%	9.3%	27.1%
Oil Eradication	Spring	770	468	40	51	1,329
Outside	Fall	237	145	14		405
Fence	% Survived	30.7%	30.9%	35.0%	9 17.6%	30.5%
Hand Eradication	Spring	1,979	932	113	1,045	4,069
Totel	Fall	597	262	22	128	1,009
-	% Survived	30.2%	23.1%	19.5%	12.2%	24.8%
Oil Eradication	Spring	1,711	901	194	503	3,309
Total	Fall	449	380	62	51	9/15
	% Survived	26.2%	42.2%	32.0%	10,1%	94 <b>2</b> 28.4%
Inside Fence	Spring	1,933	1,048	238	971	4,190
Total	Fall	638	424	65	115	1,242
	% Survived	33.0%	40.5%	27.3%	11.8%	29.7%
Outside Fence	Spring	1,757	785	69	577	3,188
Total	Fall	408	218	69 19	577 614	709
	% Survived	23.3%	27.8%	27.5%	11.1%	22.2%
	Spring	3,690	1,833	307	1,548	7,378
Grand Totals	Fall	1,046	642	84	179	1,951
	Survival	28.4%	35.0%	27.4%	11.6%	26.4%

SIZE AND NUMBER OF CURRENT SEASON RIBES SEEDLINGS ON EXCLOSURE PLOTS,
FALL 1941

TABLE 11

Exclosure Plot	Date of Spring Check	Date of Fall Check	Total CSS, Spring Check	of Ri Inc	bes Seches of	Live	gs <b>i</b> n l		Fall Seed- lings Total	Plot Sur- vival, Percent
Chowchilla Mountain	6/25	8/18	3,690	910	128	. 7	1		1,046	28.4
Cow Creek	6/18	8/13	1,833	339	251	4g	14	tons	642	35.0
Big Bar Mountain	6/6	9/2	307	17	29	31	5	2	84	27.4
Lake Almanor	6/10	9/1	1,548	78	86	15	-	-	179	11.6
Totals -			7,378	1,344	494	101	10	2	1,951	26.4

RELATION BETWEEN SIZE OF RIBES AND NUMBER OF FRUITS PRODUCED PLOT G, SIERRA NATIONAL FOREST

TABLE 12

Size Classes of Ribes. Linear Live Stem Per Bush	1-3	Green I	Fruits Pe June 27 11-25	er Ribes 1941 26-50	Bush, 51-125	Total Bushes
0-1.91	_				_	
2-5,91	41	7	7†			52
6-15.91	73	51	26	5	-	155
16-401	14	14	3	3	1	15
41-1001	_	-	-	-	_	
Totals	118	62	33	g	1	222

TABLE 13

AVERAGE SIZE OF RIBES ROEZLI BUSHES FLOWERING OR FRUITING FOR THE FIRST TIME, AND REMOVED FROM PLOTS IN YEARS AS SHOWN. (SEE TABLE 7. p. 148, OF THE 1939 ANTUAL REPORT)

, L	Total Jive Stem		30.1	192.9	3 17.6	3 10.8	3 15.6	5 33.3	28.9	5 64.5	0.29
Feet of Live Stem, by Years of Growth Bushes Fruiting First Time and Removed from Plot	Average Total	eng Jaj	10.1	5 <sup>†</sup> 72	∞ ∞	10.9	15.8	33.5	29.0		31.0
rs of e and		1934	1	ı	1	ı	1	1	ı	0.2	- 1
/ Year	1	1935	1	0.2	1	1	1	1	ı	ਹ 0	0
Eirst First	1	1935	0.2	0.5	0.2	ı	0.2	0.3	ı	0.2	0.1
re Ste ting from	] (	1957	0.1	7.0	1.2	0.2	0.3	0.3	0.2	†•0	0.3
t of Live States Fruiting Removed from	1	1958	7.0	7.4	0.0	1.5	1.4	0.3	0.5	2.5	1.2
Feet of Live Stem, by Years of Bushes Fruiting First Time and Removed from Plot	(	1939	2.3	0.5	1.9	2.0	2.7	5.3	2.3	40.3	7.1
Average of o	(	1940	5.9	10.5	4.9	9.9	7.7	21.2	13.8	16.6	22.2
Ave	(	1941	1.2	1	1	1	3.5	6.1	12.2	1	1
	Number of	Origin Bushes   1941   1940   1939   1958   1957   1935   1934 Fer bush	~	80	2	ᄅ	٦	۲	<b>,</b> 1	rH	2
Year	of Bush	Origin	1936	1935	1936	1937	1936	1936	1937	1934	1935
Date	of Bush	Малое Кетота.	6/11/41	01/01/2	<b>°</b> ор	do.	14/11/9	14/61/9	do.	6/21/40	do.
	Plot	Name	н	ы	ы	ы	II	Q	А	А	А
	Plot Locality and	Forest		Butt Creek	Plumas	National Forest			Cow Creek	Stanislaus	Mational Forest

1/Computed from actual total live stem measurements, not from averages.

TABLE 14

FRUITING OF SEEDLING-ORIGIN RIBES ROEZLI BUSHES ON 1936 BURN

		1937 Seedling-Origin Ribes Bushes. Visually Estimate Vigor Classes as Below	ling-Origin Ribes Visually Estimated asses as Below	Ribes stimated	Old Mature	
Date in 1941	Item of Data	E (Excellent) Vigor	G (Good) Vigor	F (Fair) Vigor	Bushes (Partly Burned)	Total All Bushes
May 21	Bushes Total Live Stem	8	19 174	10 49		7t0 456
	Average Live Stem Per Bush	22.1	9.2	6.4	18.7	11.4
May 21	rowering bushes Total Flowers	54.1	358	75	232	1,206
	Average Flowers Per Bush	9.79	18,8	7.5	77.3	30.2
June 3	Fruiting Bushes Total Fruits	6 228	14 141	17	43	30 429
	Average Fruits Per Bush	35.0	10.1	† <b>.</b> 2	14.3	14.3
June 18	Fruiting Bushes Total Fruits	3	10	пω	۲۱ ۲۷	15
	Average Fruits Per Bush	20.7	4.1	0.9	5.0	7.6
l	Fruiting Bushes	3	2000	None	Mone	T 1
TT STRO	Total fruits Average Fruits Per Bush	7.3	2.5	1 1	1 1	7.8
	Fruiting Bushes	3	5	None	None	88
Aug. 13	Total Fruits	1,4	11	-1	1	25
	Average Fruits Per Bush	14.7	2.2	ı	1	3.1

1 One bush was of 1938 origin.

## 8. CROSS- AND SELF-POLLINATION OF RIBES

For previously submitted material see the 1940 annual report, pp. 154-156, and Serial Report (Berkeley Laboratory) No. 113, "Self-Sterility in Several Ribes Species of the Western United States," dated December 23, 1941.

This study has been reported in some detail in Serial Report No. 113, and will be considered only briefly here.

The self- and cross-pollination tests started in the spring of 1940 were continued in May 1941 on Ribes roczli in the vicinity of Cow Creek Guard Station, Stanislaus National Forest. Fifty-one bags (217 flowers) were put on in the cross-pollination tests, and 49 bags (258 flowers) in the selfpollination tests. No mature fruits were produced from self-pollinations. As the season progressed the number of bags with one or more contained fruits, and the total number of fruits produced in the cross-pollinations were as follows: At the time of emasculation and bagging, 51 bags and 217 flowers; on June 3, 41 bags and 116 small green fruits; on June 18, 39 bags and 100 green fruits; and on August 13, 27 bags and 56 mature fruits. Some of the loss of fruits was due to rodents and some to other accidental causes such as wind and grazing animals. The fruits were picked somewhat short of the "dead ripe" stage because of apparently increasing rodent damage as the season progressed. The visually estimated condition of the fruits collected on August 13, was as follows: E (excellent) - 21; G (good) - 19; F (fair) - 6; P (poor) - 1; VP (very poor) - 9; T (total) - 56.

No germination tests have been made as yet on seeds from the collected fruits.

# 9. THE RIBES REGENERATION KEY

The blister rust program would be facilitated by any procedure which would permit a fast and reasonably accurate prediction of the intensity and the duration of Ribes seedling regeneration which would follow eradication, or any other disturbance of forest areas. For many types of routine field work the administrative personnel must estimate the regenerative capacity of control areas. The usual method of arriving at such estimations is apparently that of a subconscious integration of the many and complex factors involved.

In appraising the potential Ribes regeneration on any given control area, a blister rust supervisor seeks an answer to two questions. What will be the regeneration problem if this area remains undisturbed save for the eradication disturbance itself? And what will the regeneration problem be if this area suffers a major disturbance? The answers to these questions provide the basis for predicting the number of eradications and the spacing of eradications during the period that the area is under protective custody from the rust.

In the fall of 1940 the methods group started to develop a Ribes regeneration key, meter, or graphic chart which might be used to predict and measure the probable regeneration of Ribes on an area following cradication. Such a key could, of course, consider only the most important of the factors conditioning Ribes regeneration but should give, if successfully organized, a more consistent and a more uniformly accurate estimation of Ribes regeneration

than the strictly subjective method previously used.

Many people have actively cooperated in the elaboration and testing of the idea, and several drafts of the key have been prepared. Most of the systematic testing of the key under field conditions in the Sugar Pine Region was done by L. P. Winslow during the 1941 season.

The original plan of the key followed generally the principles of those ecologists who maintain that the flora of an area integrates all of the habitat characteristics more accurately and more satisfactorily than does any reasonable sampling of such site factors as altitude, slope, precipation, soil depth and fertility, etc.; who maintain, in short, that the best ecological index of any area is what grows upon it.

The following factors appeared in first mimeographed draft of the key (SP-BRC #38, 4/30/41): (1) Ribes population on, or recently removed from, the area; (2) plant associations, (a) timber, and (b) brush; (3) maturity of vegetation (with particular reference to Ribes), (4) vigor of vegetation (visual estimate); (5) degree of disturbance of the area, and (6) season of the year. A schedule of definitions accompanied the key in an attempt to standardize the readings obtained by different people. The "Outline consideration of Ribes ecology pertinent to evaluation of control standards" and the "Report of minority committee on modification of control standards" presented before the meeting of technical personnel of the Oakland office on April 3, 1941, summarize the early development of the idea. In addition to the key proper, a secondary chart was added to form SP-BRC #38 which indicated, in terms of probable number and spacing, the eradications necessary to achieve 4-year control on the area concerned. This draft of the Ribes regeneration key was tested extensively in the field. It was found useful, but not responsive enough to minor variations to habitat. This early key failed to distinguish between areas of similar general ecological appearance which obviously possessed inherent differences in potentiality for regeneration. All drafts of the key have worked more satisfactorily in the middle reaches of the Sierra Nevada than in the extremes of the range. In particular the first draft was not satisfactory in the northern part of the Plumas area.

Early in August 1941, a revision of the key was made during a conference of methods personnel at Shaver Lake. This draft abandoned somewhat the early conception that vegetational characters only would be used, and considered, in addition to the most important vegetational characters, a few selected habitat factors such as slope and soil. The factors making up this revision were: (1) associated plant dominants (a) timber, 10 percent, (b) brush, 10 percent; (2) maturity of vegetation, 30 percent; (3) density of vegetation, 10 percent; (4) exposure and slope, 10 percent; (5) soil moisture and fertility, 10 percent; and (6) degree of disturbance, 20 percent. The definitions and instructions which accompanied the original chart were slightly revised.

The Ribes regeneration key (SP-BRC #38, 4/30/41, and the Shaver Lake revision) was tested during the 1941 field season over the entire range of blister rust control activity in the Sugar Pine Region. A total of 831 readings or plots were taken, and 3,060 chains of strip were covered while obtaining these sample readings. The number of readings per forest was: Rogue River 17, Klamath 71, Plumas 76, Eldorado 125, Stanislaus 515, and Sierra 27.

Where the strip or systematic method of plot readings was used, a reading was taken every five chains averaging the conditions over a circle five chains in diameter (2-1/2 chains about the observer). Where a random or meander system of survey was used, a similar reading was taken at intervals as the ecological conditions appeared to change with the progress of the observer across country. The readings were plotted on a rough sketch of the area under observation thus enabling the observer to draw in the boundaries of related ecological types upon completion of the survey. The meander type of survey is ideal for examination of an area which exhibits rather uniform conditions, as for example, one side of a ridge having a uniform exposure.

In its final form the Ribes key, or a subsidiary chart, should express the "status quo" figure, or number now given by the key, in terms of number of eradications and spacing of eradications needed to establish control. At present the number or rating given by the key (Figure 1) merely furnishes a numerical rating on regeneration hazard which has been arrived at by a system which permits the blister rust personnel to cover systematically all aspects of the ecologic problem, to replicate results when necessary, and to compare widely separated areas on a valid and orderly basis. Several suggestions have been considered for evaluating the numerical rating given by the key but since they have not been adequately tested in the field we believe that no useful purpose would be served by discussing them in this report.

Toward the end of the field season a third and a definitely more complex draft of the key was prepared. This current revision included factors thought to be more critical in the differentiation of areas of general ecological similarity. The latest draft of the Ribes regeneration key (Figure 1 in this report) has not been tested extensively in the field, but we believe that it should be more sensitive to minor variations in site than were the first and second keys.

Work on the key will continue as time and opportunity permit. Many suggestions from a wide group of interested persons have gone into the development of the idea. Criticism and additional suggestions are solicited. Two closely related problems stand out as of primary importance: (1) the choice of subjects or factors for inclusion, and (2) the methods of weighting the chosen factors. The key may never be used extensively by temporary personnel, but there appears to be no good reason why it could not be developed to such a state as to warrant its regular use by permanent supervisors. The listing and detailed consideration of the many factors involved, and the emphasis placed on certain of these factors after carefully considered group discussion have materially aided the understanding of complex problems relating to Ribes regeneration.

EDAPHIC FACTORS 30	Soil Moisture	Very poor	Acration & Friability	Very poor	Depth of Soil	Very poor		Very poor
HISTORICAL FACTORS	Degree of Disturbance	None       0         Light       4         Moderate       8         Heavy       12         Severe       16         Complete       20	Forest Type & Stocking	Very even & dense       0         Good       2         Moderate       4         Fair       6         Poor       8         Very uneven & open.10	Scasonal Rainfall	Very deficient 0 Deficient 2 Fair 1 Good 6 Abundant 8	OTO- OTTOTOTO (I A)	
SITE FACTORS 50	Topographic Character	Very poor       0         Poor       14         Fair       8         Average       12         Good       16         Excellent       20	Exposure	S. SSW, & SW 0 SSE, WSW 2 SE, W. Flat 14 ESE, WNW 6 E, ENE: NW, NNW 8 N, NNE & NE 10	Slope	ver 50° 1 to 50° 1 to 40° 1 to 30°	U to 10°to	1 14 • • • • •
FACTORS OF VEGETATION	50 Maturity	Mature	Density (relative)	100% Complete 0 80-90% Excel., 2 60-70% Good 4 40-50% Fair 6 20-30% Poor 8 0-10% Very poor10	Original Ribes	0 to 10 bus, 2 11 to 30 2 31 to 100 14 101 to 500 6 501 to 1,000 8	Over 1,000IU	i i
DOMINANT PERENNIALS	30 Brush Species	None 0 Chinquapin 2 Tanbark Oak 2 Vacinnium Oak 2 Prost man., 4 Prost cean., 6		en fern velut., r cherry rry	Hazel 14 Cean.parvifol 16	Deerbrush 10 Snowbrush 20 Timber Species None 0	I C C C C C C C C C C C C C C C C C C C	DE SP 100

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FIGURE 1 - TENTATIVE REVISION OF RIBES ROEZLI REGENERATION KEY



# Section 2 - METHODS DEVELOPMENT WORK

During the 1941 field season, as in 1940, all of the Bureau Blister Rust Control camps were assigned to reeradication. The U. S. Forest Service, the National Park Service, and Oregon and California Revested Land Administration performed the only initial eradication undertaken in the Sugar Pine Region. The developmental work for the 1941 season was concerned largely with survey and investigation for testing the new Ribes regeneration key. Some time was spent on mechanical and chemical methods of eradicating heavy patches of Ribes or troublesome individual plants. Plots initiated in former years were examined and restaked. All plot fences were repaired where necessary. Reeradication work within the fenced grazing exclosure plots was performed early in the season.

# RESULTS OF 1940 WORK

# Regular Stringing Versus Pre-stringing

Statistical analysis of the field data on the relative merits of regular stringing (the laying of work lane string as the crew progresses) and pre-stringing (the laying of work lane string in advance of crew work) was completed during the winter of 1940 and the fall of 1941. (See listing of the report on page 123.) Data show that for reeradication with ERA labor there is a slight (but nonsignificant) difference in favor of regular stringing for the all-work average. Results in lighter Ribes populations did not differ greatly from those in heavier population classes. For reeradication with Forest Service P & M crews at Ribes populations below 35 per acre, regular stringing was definitely superior.

The heretofore assumed advantage of pre-stringing, (a) for areas of sparse ground cover and light Ribes, and (b) for areas of dense Ribes, did not show up. It may be argued: (1) that the labor was not of high enough quality to produce maximum efficiency in the light type of work, or (2) that the Ribes concentrations were not heavy enough to show the advantage of closer supervision, or (3) that these advantages actually are not important enough to show significant differences with the type of study made.

### Recommendations:

- l. The choice of regular or pre-stringing should be left to the judgment of the responsible field supervisor.
- 2. Segregation of eradication records by camp superintendents according to the alternate 1/4 section scheme used in the stringing study offers an excellent chance for a critical appraisal of large-scale eradication work at little or no additional cost. Extension of the studies could be made to include areas of very light and very heavy Ribes with the additional segregation of work blocks by control standards as well as by Ribes populations.

# Use of Dynamite on Large Ribes nevadense

The large Ribes nevadense blasted with dynamite near Crane Flat, Yosemite National Park, were cleaned up by hand in 1941 with a resultant saving of approximately 75 percent through the use of powder. Some seedlings are starting in the disturbed soil.

# Use of Oil on Rockbound Ribes

Results of the decapitation and oil treatment of rockbound Ribes near Lost Creek, Lassen Volcanic National Park, were encouraging. Due to closer supervision and the use of a considerably greater amount of oil per decapitated Ribes crown, the work done in 1940 by CCC crews was much more satisfactory than the oil and chemical work of 1939. A limited amount of sprouting has occurred with Ribes crowns in inaccessible places.

# FURTHER COMMENTS ON WORK DONE PRIOR TO 1940

# Paired Bush Ribes cereum Dynamite Plots (1939)

Examination of the disturbed area for seedlings showed, (1) Ribes cereum very few to none, (2) Ribes roczli few to fairly numerous.

# Eradication of Upland Ribes by Power Methods (1939)

The areas on the Sierra National Forest, California, which had been worked with the D-2 tractor (both front rake and grapple hook) showed a very small percentage of crown sprouts. Only a few of the 1940 seedlings were still in evidence in 1941, while seedlings of 1941 origin were rare.

# 1938 Decapitation-Oil Plots, Ribes cereum, Beasore Meadow, Sierra National Forest

The large Ribes cereum decapitated and oiled with a mixture of Diesel oil and crude oil (1:1) in 1938 are still succumbing to the delayed action of the oil treatment. Examination on August 2, 1941 showed four more crowns to be dead. The record of 47 percent kill in 1939, and 68.75 percent kill in 1940, now stands at 88.22 percent kill.

# Results of Dosage Tests of Diesel Oil and New Oil Mixtures on Small Ribes roczli Plants and the Effect of Oil on the Viability of Ribes Seeds and Seedling Establishment

The twenty-nine fenced milacre plots established in 1938 on Chowchilla Mountain, Sierra National Forest, California, were rechecked on July 29, 1941. While 1941 proved to be a better seedling year than 1940, it can be generally classed as a "below average" year for Ribes seedling regeneration and survival. Accumulative results of the plots are shown in Table 1. Survival of 1940 seedlings was generally low for dosages; current season seedlings were fewer than in 1940 on both treated areas and controls. There are indications, however, that the supply of viable seed in the soil may be running out on the plots.

The six milacre plots treated with Diesel oil in 1937 at Boggy Meadows, Sierra National Forest, California, were examined July 30, 1941. This date was somewhat late for examination as numerous current season seedlings had dried up or had been trampled by cattle. Accumulated results are shown in Table 2. These plots are immediately adjacent to numerous large heavily fruiting Ribes roezli and the introduction of unoiled seed doubtless has occurred. It is indicated that even the heaviest dosages no longer affect the germination and temporary establishment of seedlings where large numbers of fruiting bushes are left on contiguous areas.

# RESULTS OF 1941 WORK

As a means of showing year to year changes on certain ecology plots, i.e., Ribes growth of removal, tree growth and brush spread, a series of pictures have been taken from various points on and about the plots. These pictures, taken from low oblique angles, furnish excellent detail on the character of vegetation but do not show its distribution too clearly. An attempt was made in 1941 to make aerial photographs of plots by climbing a convenient tree and shooting down and across the plot. The method is promising but difficulties of angular perspective have not been entirely overcome in the finished prints. Further work is planned for the coming season on this semi-aerial method of plot mapping.

# Time Studies of Mechanical Eradication of Ribes roezli

Time studies were conducted out of the Soquel CCC camp, Sierra National Forest, California, to determine the average savings per acre accomplished by use of the caterpillar D-2 tractor equipped with front end rake and Ribes grapples operated from a rear end drum (see 1939 annual report, pp. 155-162; 1940 annual report, pp. 121, 123-124). Plots of from one to three acres in size were laid out and worked by both power and hand methods. With CCC labor proper use of the power equipment in conjunction with hand work results in a saving of approximately 65 percent of the man-days which would have to be expended in the heavy concentrations of Ribes roezli by hand labor alone. Data for these tests are shown in Table 3.

The machine reached the Plumas National Forest, California the first part of September and was used on Ribes eradication until the middle of November. A number of small but very heavy concentrations of Ribes roezli were eradicated in the Cold Water area during September. For the balance of the season the machine was employed to good effect in the Lost Creek burn in the southern part of the forest where large and numerous R. roezli were growing among down logs and poles killed by fire in 1931. Both rake and grapple hooks were employed as the occasion demanded.

A total of 70.25 man-days was expended on actual eradication covering 40.5 acres and removing approximately 139,700 mature Ribes at a cost of around 1/2 cent per Ribes. A further breakdown of the above figures shows: an average of 3,449 Ribes per acre; 1.73 acres per 8-hour man-day; and 1,988.6 Ribes per 8-hour man-day.

RESULTS OF 1938 DOSAGE TESTS OF NEW OIL MIXTURES ON SMALL RIBES ROEZLI BUSHES, CHOWCHILLA MOUNTAIN.

SIERRA NATIONAL FOREST, CALIFORNIA

1941	$\omega$	28		1	2		*		- 1		7								2			1	2		1			7	7	
uo	Bushes CS	15	1	_	1	-		-		1		1					ا ات		2				·		Н	_		134 -	∞	_
Regenerati	rui ting Bushes emoved	1		- 2	-	ł	1	ı		2	1	1		1	ı	3		1		1	1	1	ı	1	1	1	1	3		2
of of	CSS	13	ı	7	7	1	1	1	1	1	ı	1	1	ı	26	σ	13	ı	∞	1	38	94	14	36	3	7	1	17	. 96	15
Status	Bushes	10	a	٦	ı	ı	٦	ı	-	p=-{	<b>_</b>	<b>~</b> -1	1	ı	25	0,0	<u></u>	1	<i></i>	1	<b>-</b> ‡	19	22	7	7	1	1	190	. 27	156
6	CSS	151	1	N	1	1	1	ı	1	ر ع	<i>\\</i>	1	1	ı	54	17	.0	-	7	1	77	93	22	7	3	1	1	87	137	81
193	Bushes	20	2	#	1	ı	_	1	3	/L: 7	ις	۱ '	1	1	17	· to	<b>†</b>	1	5	1	1	9	13	, –1	ı	1	1	212	25	202
	Percent Bushes Killed	96	93	96	100	100	96	100	83	kg.	63	100	100	100	71	91	81	100	95	100	100	92	さ	96	100	100	100	None	None	None
Number Bushes		195	43	105	55	70	137	な	18	( <del>)</del> (5)	15	56	59	35	58	,†	27	109	110	65	57	77	210	23	9†1	127	135	209	25	170
	sel Oil + 1de Oil														•	•	2.0	•		•									4-70	
Gallons Per 1	+ 1 0i1							4						1							٥•5	1.0	1.5	2.0	3.0	5.0	10.0	Controls	್0೪	do.
in	iese Oil												5.0	•								8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0								\$ C C C C C C C C C C C C C C C C C C C
Dosage	Bxt				2.0																									+ 400 44 1100 1
	Flot No.	28	7	2	3	#	7	9	7	∞	6	10	11	12	13	14	15	16	17	18	29	19	20	21	22	23	24	2, 1,	26	27 GSS

TABLE 2

RESULTS OF DOSAGE TESTS OF DIESEL OIL ON SMALL RIBES ROEZLI PLANTS AND THE EFFECT OF OIL ON THE VIABILITY OF SEEDS PLOTS AT BOGGY MEADOWS, SIERRA NATIONAL FOREST, CALIFORNIA

REATED IN 1937

	Trampling	Moderate	Moderate	Moderate	Severe	Severe	Severe
Aug. 10, 1938	1938 Seedlings	Nume rous	Few	Few	1	•	I
6261	Other Vege- tation	Good	• op	Fair	do.	None	None
June 30, 1939	1939 1938 Other Seed- Seed- Vege- lings lings tation	ı	1	I	Ī	1	1
June	1939 Seed- lings	29	107	21	S	I	1
0461	. g	Good	•op	٠ م	मुखाः	Poor	Poor
June 13, 1940	1939 Seed- lings	1	1	N	3	I	1
June	1940 Seed- lings	193	159	32	109	19	9
30, 1941	1941   1940 Other Seed- Seed- Vege- lings lings tation	Good	• op	Fair	•op	• op	Poor
Ly 30.		•	1	1	I	1	1
Ju	1941 Seed- lings		#	Н	18	65	7
1937 Dosage		0.5	1.0	1.5	2,0	3.0	J.
	Plot Mo.	1	7	3	7.	Ŋ	0

TABLE 3

1941 METHODS STUDIES WITH D-2 TRACTOR AND CCC LABOR, ERADICATION OF RIBES ROEZLI, SOQUEL AREA, SIERRA NATIONAL FOREST, CALIFORNIA

1					1.7		1,		1			1			_1
			Remarks	No Ribes count	mechanical work	•op	Ribes count in-	seedlings	No clean-up performed	Ribes count in- 35-45 cludes 1940	Seedlings	To be cleaned	up later	• op	
Acre	M/D Hand	Erade.	H_CluO	אר   עה אר		35-45	21.5 40-50		40-50	35-45					
Days Per	Clean-	dn	Man	14.5		13.1	21.5			15.7					
		al	Man	200		6.5			7.3				49.0	56.0	
6-Hr.		Initial	Tractor Man	6 0		2.2			7.5						
	ďn-		Ribes	7.181		101.7 2,506	129.0 14,416			8,142					
k Data	Clean-up	Man	Hours Ribes	87.0	-	101.7	129.0			94.5					
Hand Work Data	Ini tial		Ribes									•	11,543	336 12,061	
	Ini	Man	Hours										584	336	
	tion	ຜ	Man						110.2						
	Combination Rake + Hooks	Hours	Tractor Man						36.7						
Data	ooks	2	Man			78.7									
Mechanical Data	Rear Hooks	Hours	Tractor Man			26.2									
Mec	Rake	rs	Man	13.3											
	Front Rake	Hours	Tractor Man	9.9			2			2					
	Area		Acres	1.2		2.0	1.0		2.5	1,0		(	7.0	1.0	1/~
		Flot in	No.	Н		α	~		`	2		(	٥	7	1/-

1/Estimated 2/1939-40 work, no mechanical data available.

As a means of reducing wear on the cable used with the grapple hooks and drum and to make it easier to toll out cable by hand, a pair of steel rollers was mounted on the rear drum. These rollers, about the size of an ordinary household rolling pin, are set about 10 inches apart in a vertical position. Production data for tractor work on the Plumas are shown in Table 3. Plate 1 illustrates Ribes conditions in the two types encountered.

# Progress of Ribes Eradication by Power Methods

The D-2 caterpillar tractor equipped with rake and hook attachments was used for Ribes eradication work on the Sierra National Forest until the middle of July. After a brief intermission as stand-by fire equipment, the machine was used for a short time by the California Forest and Range Experiment Station on the Stanislaus National Forest, California for brush stripping in connection with a seeding project designed to take advantage of the very abundant current crop of sugar pine seeds.

# "Up and Over" Peavey-Handled Tool

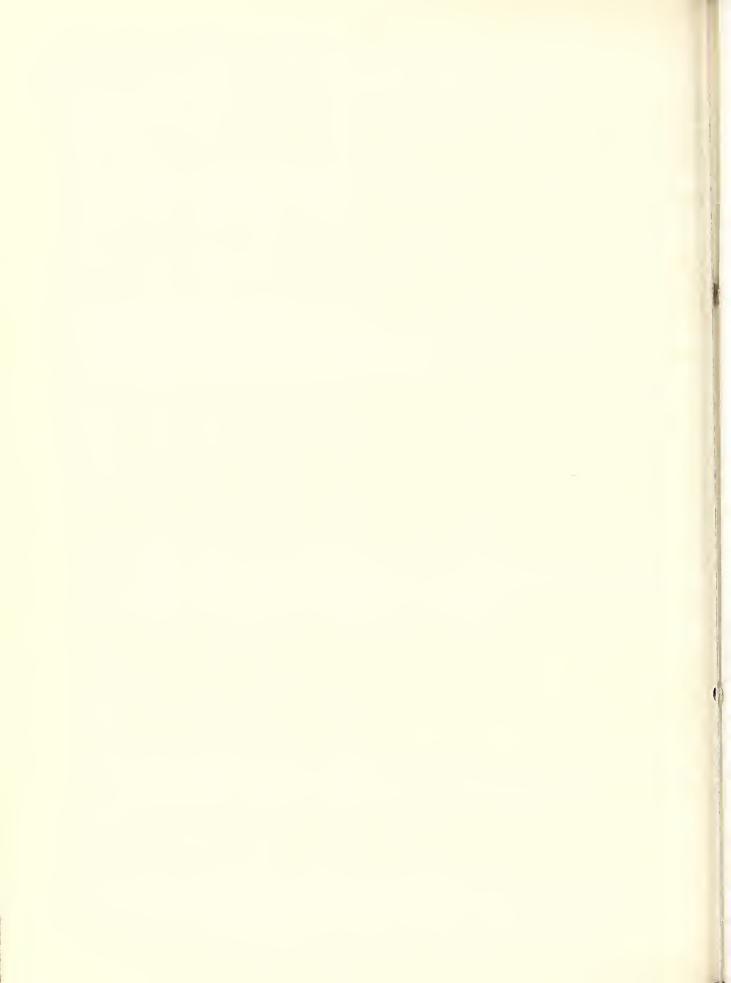
Of the several heavy duty peavey—handled Ribes tools developed in 1940, one (the "up and over" model) proved very successful. The term "up and over" was applied because it closely describes the movements of the handle of the tool during the pulling operation. The operator first engages the crown of the Ribes bush with a hooking action, then he lifts up the handle and follows by pushing or pulling over and across the top of the bush and finally down to the ground on the side opposite from the point at which he started the upward lift. Plate 2 presents a sequence of pictures of the tool in use. Present plans are for a lighter model which retains the tremendous mechanical advantage and long arc of the lift needed in a puller of this type. An average man can obtain a starting pull of over a ton when the tool is properly placed.

# Hydraulic Jack and Tongs

In order to study the action of a hydraulic jack in the eradication of very large Ribes or as an accessory to motor-driven equipment, a set of tongs (similar to a several-clawed ice tong) fulcrum beam, and adjustable foot were designed by J. F. Breakey. The lifting power was supplied by a hydraulic jack, bumper type. The mechanism was tried out under varying conditions. The results obtained were "slow but sure." This device is still definitely in the developmental stage. Plate 3 shows the apparatus set up to lift a large Ribes nevadense crown along a stream in Yosemite National Park, California.

# Claw Mattocks

The field operations men of the Sugar Pine Region completed the design of an all-purpose claw mattock, and an attempt was made to purchase a supply of this tool. The demands of national defense for tool steel, for pattern makers, and for materials, conspired to prevent the manufacture and purchase of the tools.



#### PLATE I



No. 1. <u>Ribes roezli</u> near old salt-log in vicinity of Yellow Jacket Mine. Plumas National Forest, California.



No. 2. D-2 tractor cutting initial path through heavy ribes concentration.



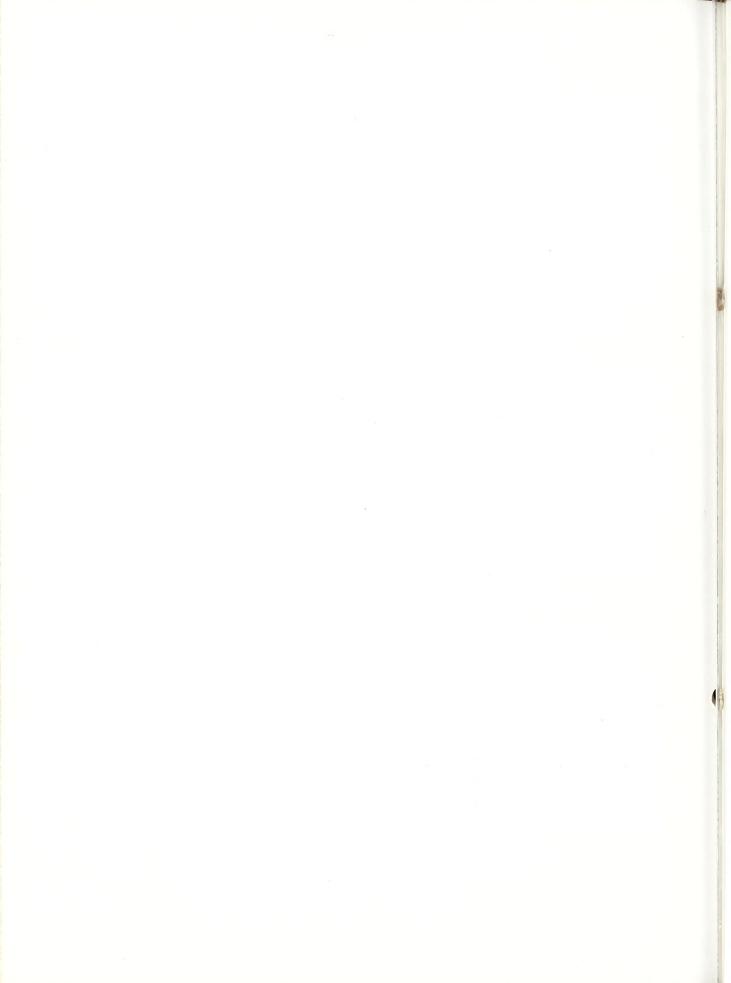
No. 3. Tractor dumping rites on previously cleared spot.



No. 4. Same as No. 5 at right showing ground conditions. Note ribes rooted under logs.



No. 5. Troublesome stand of R. roezli which followed 1931 fire on Mooreville Ridge, Plumas National Forest, California.



### PLATE 2



No. 1. (W 7). Two-pronged ribes Peavey of the up-and-over type.



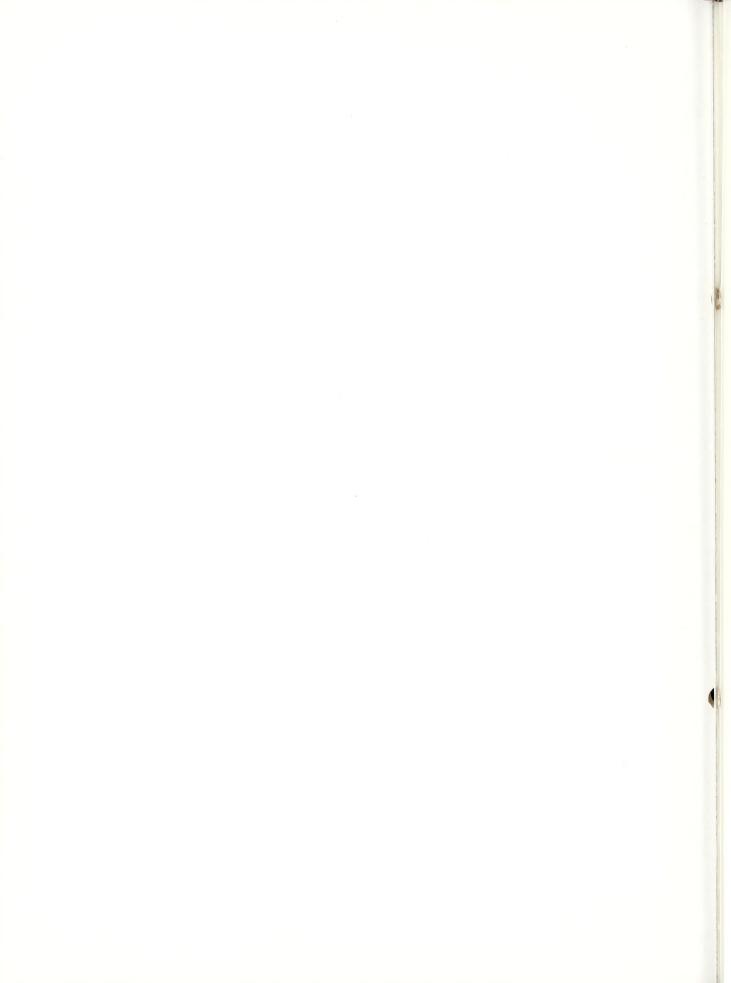
No. 2. Worker engages bush by striking tool beneath ribes crown.



No. 3. The Peavey handle is lifted up and pulled across and over the bush.  $\,$ 



No. 4. Pushing the handle down to ground results in  $\epsilon$  clean lift of the bush.

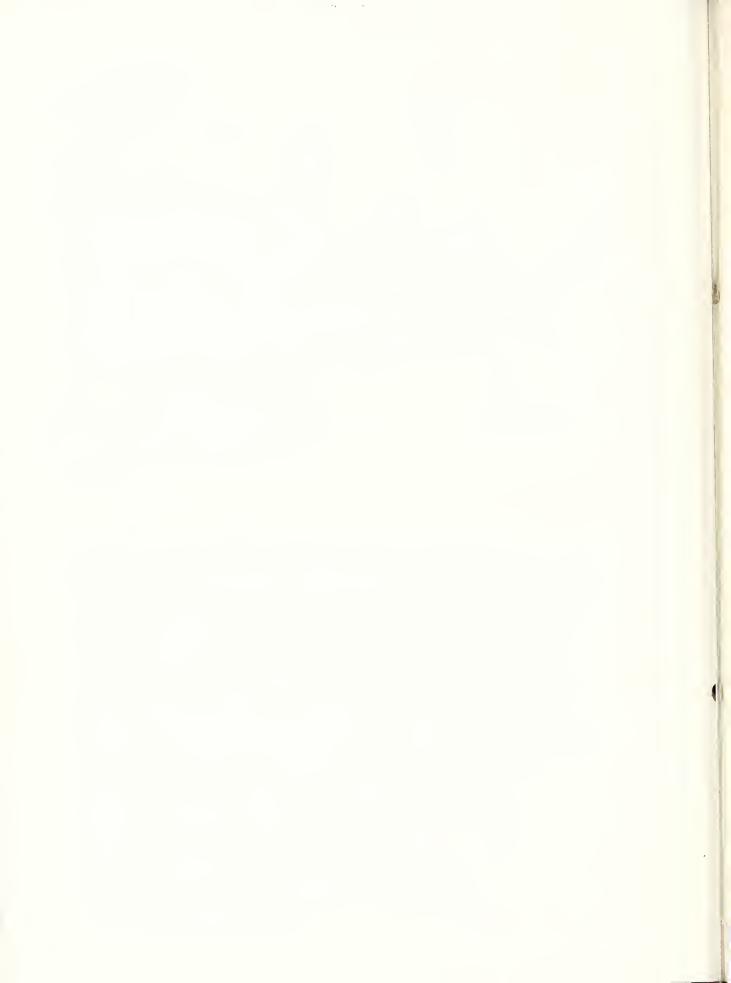




No. 1. Preheating torch with a working temperature of 2,000°-2,400° F. Tank capacity of 1-1/2 gallons.



No. 2. Preliminary design of tongs and hydraulic jack. Note size of ribes crown being lifted.



# Oil Tests on Ribes roczli, Plumas National Forest

To date considerable promise has been shown by the application of Diesel oil to the crowns of intact Ribes roezli bushes. Over a period of years, oil plots of various sorts have indicated that old, large-sized bushes of R. roezli can usually be killed by a comparatively light dosage of oil when applied directly on the crown of the bush. Young, vigorous, fast-growing 3- to 5-year-old bushes are much harder to kill than older mature bushes. Two small oil plots were established - one near Cold Water and the other on Mooreville Ridge, Plumas National Forest, California, to extend our data on the effectiveness of oil treatments and to serve as direct comparisons of kill and regeneration with adjacent areas which had been worked by the D-2 tractor. The Cold Water plot, 1/4 square chain in size, was completely covered with Ribes roezli. Eighty gallons of oil were used at the rate of approximately one quart per bush. One very large R. nevadense received about three gallons of oil.

The Mooreville Ridge plot was located among R. roezli of the individual crown type and received a similar dosage. Bush kill and seedling regeneration will be checked in the future. These plots should furnish an interesting comparison with the severely disturbed tractor areas nearby.

# Burning Experiments

As a follow-up to the use of a burning torch for killing Ribes, started by Benton Howard and Ralph A. James in 1940, a small Hauck preheating torch with 6-foot hose and pressure tank was obtained. This type of kerosene burning torch produces a very hot blue flame about six inches long and two inches in diemeter. A tank with 1-1/2 gallon capacity was chosen for convenient carrying on a packboard; the 1-1/2 gallons of fuel is ample for half a day's work. Plate 3 shows the torch in operation.

As shown in Table 4, some 23 rockbound Ribes nevadense were burned for two, three, or four minutes per crown. Most of the R. nevadense were growing in the crevices of solid rock along a stream where hand eradication was impossible. Seventy-seven R. roezli growing in rocky soil were likewise burned for periods varying from 1/2 minute to 8 minutes. In some cases the length of treatment was determined by the size of bush. The tests made by Howard and James in 1940 showed a good kill for completely rockbound Ribes and about 50 percent kill in Ribes growing in average soil.

TABLE 4

# BURNING TESTS ON RIBES ROEZLI AND ROCKBOUND R. NEVADENSE, SOUTH FORK FEATHER RIVER, PLUMAS NATIONAL FOREST, CALIFORNIA, NOVEMBER 4-5, 1941

		Total							
Ribes Species	1/2	1	1-1/2	2	2-1/2	3	4	g	Bushes
Ribes nevadense	-		-	g	-	10	5		23
Ribes reezli	1	15	7	18	1	16	14	5	77
Totals	1	15	7	26	1	26	19	5	100

# LABORATORY AND GREENHOUSE WORK DURING 1941

At Berkeley, full use was made of laboratory and greenhouse facilities during the winter of 1940-41 to carry on the following: (a) routine care of Ribes Garden and greenhouse; (b) chemical and physical examination of many soil samples taken from field plots and study areas in California, Oregon, and Idaho; (c) tests on the viability, longevity and general germinative response of Ribes seeds. The following special reports were completed and distributed during 1941. The practical significance of the data in these special reports is noted in the following:

### Serial No. 108

Methods Studies of the Tagging of Ribes before Eradication

........Virgil D. Moss

In regard to rapidity of work by regular and pre-stringing methods slight by nonsignificant differences favored the regular method. Efficiency, i.e., number of plants left on the ground after the first working, was significantly better for the regular method in areas of high Ribes population and closely approached significance for low populations.

# Serial No. 109

A Key to the Ribes of California

......Clarence R. Quick

Forty-three species and varieties of Ribes are listed and described so as to facilitate their identification.

# Serial No. 110

An Approximate Index of Habitat

..........Clarence R. Quick

The proposed scheme and formula may be useful in correlating known sites of serious Ribes regeneration, or insistent rust development with sites of similar potentialities.

# Serial No. 111

Experimental Germination of Ribes Seed, Series of 1940

........Clarence R. Quick

These tests represent 1,548 separate cultures of Ribes seeds totaling 99,670 seeds and covered 14 topics as related to germinative response of Ribes seeds. Viability tests on old seeds collected from herbarium sheets show that several Ribes species can retain viability under these conditions 17 years.

# Serial No. 112

Manual for Care of Ribes Ecology Plots, Sugar Pine Region

.....Clarence R. Quick

Outlines schedules to be followed in care and in data taking for all field plots and includes location data and general objectives of the various plots.

# Serial No. 113

Self-Sterility in Several Ribes Species of Western United States

Controlled cross- and self-pollination of Ribes roezli, R. nevadense, and R. viscosissimum showed that these Ribes normally set fruit by cross-pollination. Eradicative effort in connection with the control of blister rust disease should be aided by natural phenomena once the number of flowering Ribes per acre has been substantially reduced. The small fruit crop of scattered Ribes and the significance of rodent attacks on a diminishing fruit crop will aid the natural suppression of Ribes which normally takes place in ecologically maturing forest stands.

Field Study of the Relative Merits of Regular Stringing and Pre-Stringing for Ribes Eradication Work in California, December 9, 1941.

....L. P. Winslow

Analysis of field data for regular stringing and pre-stringing in California showed that there is no obvious advantage in saving time or efficiency of work from either method for the field conditions under which the study was made. The choice between regular or pre-stringing should be left to the judgment of the responsible field supervisor.

# STATUS OF RECOMMENDATIONS ON SPECIAL METHODS OF RIBES ERADICATION AND SUMMARY REPORT ON NEW DEVELOPMENTS OF 1941

# Recommendations

Except as noted, reference should be made to the 1939 and 1940 annual reports for detailed recommendations on the following methods and equipment:

- (1) Light or medium weight claw mattock.
- (2) Use of dynamite for blasting troublesome Ribes.
- (3) Broadcast spraying with Atlacide (Ribos petiolare) or Diesel oil (R. roezli seedlings).
- (4) Diesel oil for decapitated Ribes in rocky locations.
- (5) Dry chemical for treatment of decapitated Ribes. Use the new formula of 1 part by weight of dry, fine crystal common salt and 1 part by weight of dry powdered borax technical.
- (6) Bulldozer methods for brush removal in stream type.
- (7) D-2 caterpillar tractor equipped with front end brush rake and rear end power hooks. Install steel rollers on rear end drum to guide and prevent undue wear of the cable.

# Developments of 1941

An important new development of 1941 has been the testing of a Ribes regeneration key in both the Northwestern and Sugar Pine Regions. The purpose of this key is to facilitate the evaluation and interpretation of all ecologic data for any given area of ground to the end of predicting what the future regeneration of Ribes on that area will be and at the same time to aid in establishing correct eradication plans for the immediate suppression of Ribes. Although the key is still in its developmental stage, preliminary tests of the key were encouraging and further work should improve its usefulness and accuracy.

The operation of the hooks from the rear end of the D-2 tractor was improved by installing in a vertical position on the drum a pair of 12-inch steel rollers. This installation made it easier to roll out the cable by hand and reduced friction and wear on the cable when the hooks were being pulled at an angle to the revolving cable drum.

An improved Ribes peavey referred to in this report as the "up and over" type was designed and tested in the field with excellent results. A Ribes tongs and hydraulically operated bar for lifting large deeply rooted Ribes was designed by J. F. Breakey and tested under field conditions in Idaho and California. Special interest was attached to the design of the Ribes tongs with the thought that they might be adapted to power equipment. It is unlikely that this type of apparatus will be useful to one- or two-man crews, unless operated by power.

Repetition of cross- and self-pollination on <u>Ribes roezli</u> confirmed previous data showing that this species normally sets fruits in nature by cross-pollination.

Encouraging progress has been made in Idaho and California in Ribes ecology work. The results of this work, as described by Virgil D. Moss (Northwestern Region), and Clarence R. Quick (Sugar Pine Region) relate to the germinative responses of white pine and Ribes, to the effects of grazing on Ribes regeneration and to general relationships of Ribes ecology and white pine and sugar pine silviculture.

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